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THE JOURNAL
OF
COMPARATIVE MEDICINE
AND
VETERINARY ARCHIVES.

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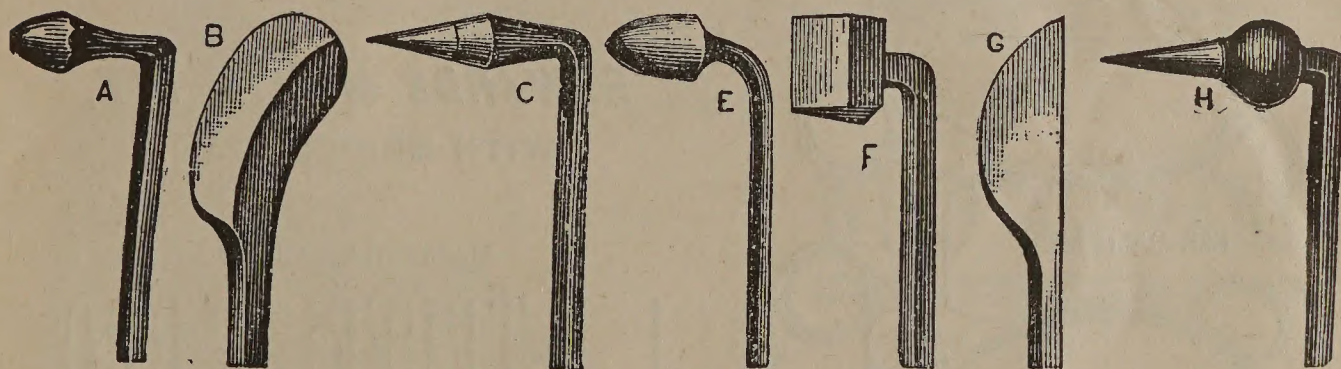
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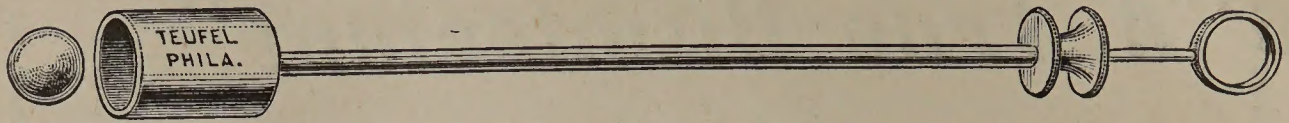
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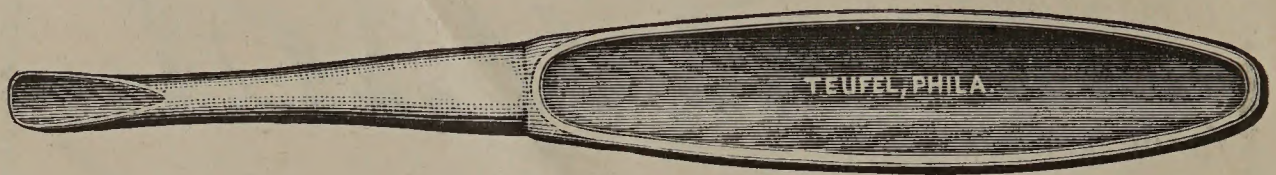
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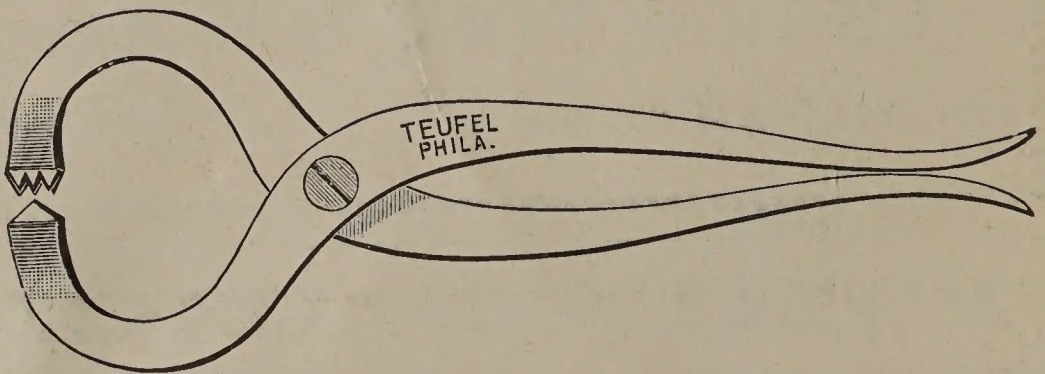
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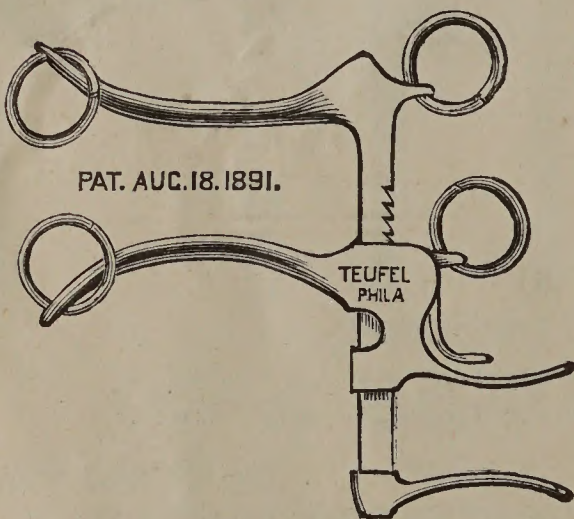


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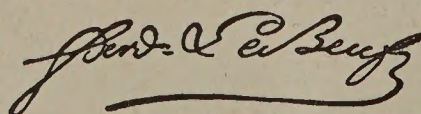
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THE JOURNAL OF COMPARATIVE MEDICINE AND VETERINARY ARCHIVES.

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MARCH, 1893.

No. 3.

AGRICULTURAL SHOWS, JUDGES AND THE VETERINARIAN.*

—
BY R. S. HUIDEKOPER, M.D., Veterinarian.
—

In the earliest days of which we have written records of the doings of man in connection with the domestic animals, we find the greatest agricultural and medical authorities assuming the functions of the Veterinarian, and in many cases the productions of the Greek and Roman writers attained their greatest celebrity from their knowledge of the diseases of the lower creation. In the middle ages the knight, the nobleman and the physician were proud of their attainments in diagnosing and treating the diseases of the horse, the hound and the hawk, which furnished the demands of war and sport for the better classes of the day. We find the earlier veterinarians of reputation, recognized authorities and advisers of Kings and Ministers in the establishment of governmental breeding studs, in the control of cattle commerce, and in the supervising of legislation in regard to epizootic diseases.

In the present century, when veterinary medicine took rapid strides in advancing the education of the multitude in its science and arts, the agricultural societies of the old country have ever given the Veterinarian his proper place, and have relied upon his judgment for the decision of those more delicate technical points for which he is fitted.

In America, where the veterinary profession has been but recently recognized, except in the sporadic cases where some individual has enforced his own recognition through the merits of his own attainments, the Veterinarian has not been given his proper place in the advisory boards of the agricultural community.

* Read before the Pennsylvania State Veterinary Medical Association.

Perhaps, probably, this has been, to a great extent, his own fault. The schools have taught the elements of medicine, the anatomy of the horse, the physiology of the generative organs of the cow, the pathology of the horse and the pathology of the ox as if these were entirely separate lines of study, and they have given diplomas to students who were sent out to look at animals on the hoof and did not know the differential external points of a thoroughbred stallion from a Clydesdale mare, or a Hereford steer from a Jersey cow, and when it came to sheep and hogs did not know that more than one race of each existed.

Counties hold their agricultural fairs, and the local Veterinarian is not heard of in connection with them ; States have greater fairs, and still I do not know of one where the Veterinarian has been recognized officially.

The National Horse Show Association of America (limited), holding shows in New York, has employed three Veterinarians, with the title of "Veterinary Inspectors," at each of their exhibitions, in order to guarantee to the exhibitors proper sanitary supervision, and to have on hand a veterinary attendant in cases of emergency ; and these Veterinary Inspectors are required to be within call of the judges in the ring, in case the judges desire professional opinion in regard to any of the animals in the competition.

The Philadelphia Horse Show, organized in 1892, also employed Veterinarians.

The United States Horse and Cattle Show Society (New York), at its Spring show, 1892, employed three Veterinary Inspectors, who examined all horses before they came before the judges, and the regulations required that none but sound horses should be considered. Still, even at this show, which attempted to give the Veterinarian more recognition than he had been accorded before, want of system, too short a time and previous habit did not allow of as rigid an inspection and regard for the veterinary certificates as might be desired. It was, however, a great step in the right direction.

The veterinary profession should be closely allied to all agricultural shows for their mutual interest.

The Veterinarian derives from his connection with agricultural shows a public reputation, a recognition of his position as an expert, an experience which is an education, directly the fee which he receives for his services, and indirectly the practice which it brings him in the future.

The agricultural society and the public derive from the employment of an expert veterinarian a judgment of the animals exhibited which can only be had from one who has made the subject his life's work; they are able to be perfectly satisfied that their awards have not gone to undeserving animals, and posterity is benefited by the elimination of animals from the "blue book" of breeding which would be detrimental to the future stock of the country.

The position of the Veterinarian in agricultural shows in America is still, however, a tentative point, and in order to establish it the duties of the judges should be first well defined.

The object of an exhibition of animals is to bring together animals of certain classes which are fitted to fulfill the purpose for which they are intended, and to decide upon the relative merits of such animals as conform to the requirements of their class. An animal which may be perfect in one class may be worthless in another. A thoroughbred mare of golden pedigree may be a grand stake winner, and if she has a neoplasm in the mammary glands may be unfit for a broodmare; a Durham bull may be the type of a shorthorn winner, and if he is impotent may not be eligible for a breeding class; a setter dog may be a picture of perfection, and if he is gun-shy cannot compete in a field trial; and the most beautiful cock ever seen, if a coward, is not fit for the pit.

The rules and regulations of the prize list should define distinctly what is demanded, and it is, first, the duty of the exhibitor to determine if his animal is eligible for competition; second, to enter it properly. It is then the duty of the judges to decide, first, if the animal is eligible, and, secondly, upon its comparative eligibility in the class in which it is shown.

For this we must divide our animals into their respective classes, according to their species, races and the service for which they are intended. Following the ordinary classification of veterinary text-books on anatomy, we have: The horse, horned cattle, the sheep, the goat, the hog, the dog, poultry.

In each of these classes we have the various races of the species which offer qualities of conformation and functional abilities as diverse in some cases as the species are, one from another.

In the horse there is the heavy draft, intended to pull the greatest loads of a city traffic, and lighter draft, which must pull the omnibus at a trot. The thoroughbred which wins at four

furlongs may have the same breeding, but is as far removed from the horse of the same breeding which can run a four-mile heat race as is the infant's pet, a Shetland pony, from a perfection of a hackney mare, and yet the two latter are relations.

The Hereford steer dressing 1,400 lbs. of beef or a brawny Polled Angus bull, and a Dutch cow which gives twelve gallons of milk a day and a Jersey cow which gives twenty-eight pounds of butter a week, are all horned cattle, and still they require as different judgment as is needed for the beautiful mutton qualities of a flock of Southdowns and the silky fleece of a lot of Rambouillet Merinos.

Certain general principles govern the methods of adjudication of the merits of all animals :

1st. *Race type*, showing the character of the class under consideration.

2d. *Conformation*, regulated by the demands of the type exhibited.

3d. *Individuality*, by which the special merits of each animal examined are compared with those of its competitors.

The determination of the race type demands the educated experience of the expert, who must be cognizant of the origin and history of the race, of the interbreeding and modifications which have been produced by the fashion of modern times, and of the effects of locality which are capable of making important changes in the character of even primitive types.

Race type requires still closer scrutiny ; here the modifications produced by civilization, and the artificial methods exercised by man in adapting animals to his uses, makes the lines between distinct families still more difficult to determine. The very adaption of lines of breeding to specific purposes to suit the taste of the breeder, generates in the expert a prejudice in favor of that special *genre* to which he has been devoting himself, and still it renders the honest expert more acute to recognize the differential points of animals under consideration, and allows him, when governed by rules for judging, to lay aside personal feeling and find in the very faults, from individual point of view, winning qualities in classes not favored by himself.

JUDGING HORSES.

The classification of horses is based upon their destination as breeders or as motors, and yet while in some classes the points demanded are absolutely different, in others they are so closely

allied that the one cannot be thought of without the other. A short resumé of the points to be considered will make the references to the characteristics of the various races more easily understood.

The Head. The head by its shape, profile of face, breadth of forehead, angle of occipital bone and development of jaw, is characteristic of race in a breeding class, and evidence of intelligence in a utility class.

The Neck. The shape and size of the neck is a sign of quality, and its valuation is absolutely dependent upon the utilization of the animal. While the horse used for stud purposes is handsome, with a thick, curved and solid neck, the mare or gelding intended for a lady's victoria must have one as thin as that of the swan, and all judgment of this part of the body must be secondary to the other more essential parts.

The Shoulders. The shoulders, comprising the shape of the withers, the development of attachment of the muscles from the neck and the body, the angle of the scapula to the horizontal axis of the body and the development of bone and muscles of the shoulder blade itself, are evidence of utility rather than of race, and yet certain *families* demand the characteristic of shoulder because their type is based upon their utility, as is exemplified in the Hackney (Mr. Cassatt's mare, Plaisanterie, or Mr. Lawrence's horse, Fashion), where the action could not be obtained without the proper anatomical conformation.

The Arm. The arm must conform secondarily to the shoulder, and must be muscled according to its surroundings.

The Forearm. This organ is not usually given sufficient consideration. Many an apparently bad shank, fetlock and foot is blamed when the fault lies in the defective aplomb of the forearm, which slants forward or backward when its center of gravity should be almost perpendicular. The development of the muscles varies according to race, which must always be taken into consideration.

The Knee. In judging, the knee is included in the other structures below, known as the anatomical foot. It should be broad and flat, the prominences of each individual bone well developed and be free from blemishes.

The Shin. The metacarpal region can be good in such varied forms that the anatomist becomes desperate when he studies clinical results. The proper shank has a clean, wide bone with the three rows of posterior tendons well separated, so that the leg at this point is broad from in front to behind, and forms a flat plate

from side to side, and it should form a vertical pillar between knee and fetlock. And, yet, race colts bring thousands of dollars with shanks as bent as those of a broken-down post horse. Draught horses with splints, which make the bone as knotty as an Irish shillalah, do the best of work, and the type of a perfect bone "bucks" at the first training.

The Fetlock and Pastern. These parts are somewhat subject to the general character of the horse, but should always be strong, evenly set, well developed at the bony points of tendinous attachments and free from lesion.

The Surgical Foot (the hoof) should be
Shaped to suit the animal it carries.
Sound in texture.
Support on ground level.
Symmetrical.
Satisfactory to examiner.

It is not in place here to go into the anatomy of the foot, and many shapes of feet are admirable working organs, but the above classification must be followed in judging. Great flat feet are characteristic of the Clydesdale, Shire, Dutch Draft and Percheron, and while they may still be good feet with considerable variation in size and shape, a small, high-heeled hoof arouses suspicion of malformation, and calls for a close examination of the bony parts subjacent.

The texture of the hoof must be good, but allowance can be made for the general condition of the animal and for the evidence of accidental injury and want of care on the part of the owner.

The evenness of support on the ground is a matter of expert judgment only. An abominably crooked foot in a mule-hoofed thoroughbred may not be considered an unsoundness or a hereditary disease, while a much less deformed foot in a Shire would condemn the animal.

There should be a well-established symmetry in the size and shape of the feet on a horse. The fore and hind feet should be relatively well proportioned. The pair of the anterior and posterior biped should be symmetrical. One narrow, small foot may allow the animal to travel sound, may have been acquired accidentally, or may have "been foaled so," but in any case it promises a continuance in the progeny of a breeding animal.

Finally, a considerable amount of latitude in regard to the feet must be given to the expert examiner, whose experience has taught him what is useful and what is not.

The Body. No matter what the class of horse may be, the

shape of a good body demands depth of the chest, free, open arching of the ribs, ribs well back to protect the abdomen and a regular movement indicating a normal condition of the organs contained under them.

The "tucking" of disease, or the reduction of the posterior part of the barrel produced by training must be differentiated from the congenital shad belly of many "crocks" which would otherwise pass for fair horses.

The Croup. The shape of the croup, no matter what is the condition of nutrition of the animal, is based entirely upon the conformation of the bony pelvis and is in all pure breeds a distinction of race. The long, horizontal croup is therefore essential in the Arab, thoroughbred and their crosses, while the Irish horse, with his long, angular croup, and the Shire with his short, angular croup, transmit their characteristics to the hackney and form a type. The set of the tail in pure races coincides with the form of croup. The thigh and leg in well conformed horses also correspond to the form of croup, but when it comes to individuals the most varied results are sometimes obtained by animals with closed coxo-femoral angles and open femoro-tibial, and vice-versa.

The Hock. The hock admits of only two decisions for the lay judge, good or bad; it is a good hock and in conformity with the general development of the animal, or it is a bad hock, because it is badly made, or is not in conformity with the other structures of the animal. No relative estimation of the value of a hock can be made by any one but an anatomist and experienced clinician.

The hind foot is estimated by the same general rules as are the anterior homologues.

After the conformation of the horse has been examined sufficiently to determine the race type of the animal and the grade of perfection which the individual attains in it, there comes the estimation of relative merit, which is based upon quality and individuality.

Quality. By quality we understand that *ensemble* of purity of type, condition of organs and functions which permits of the anatomical structure being used to advantage, and a development of the nervous system, brain power and healthy periferal sensory and motor nerves which permits the horse to control and exert all of its energies.

The valuation of quality is, to a certain degree, a matter of opinion based upon experience, and it demands considerable experience to determine it in all cases. The novice of good taste

the artist who has never seen a horse, can appreciate an animal of perfect quality, whose every pose at station and every symmetrical movement in action denotes grace, strength and intelligence. But in the examination of dealers' horses just off of the cars, brood mares heavy in foal, animals rough and uncared for, just up from pasture, or animals deteriorated by illness, it requires not only a careful appreciation of the conformation, but also of the functional activity of which the individual part is capable and a rigid comparison of the harmony which exists between these.

Individuality furnishes the final basis for appreciation of the comparative perfection of the development of form and quality which is exhibited by the animal.

Manners. Another element which plays an important part in the estimation of animals, but which has a variable value according to the use for which animal is intended, is manners. By manners we mean the evidence of education which the animal has received, which fits it for the use for which it is intended. A stallion for breeding purposes need only be so bridle-broken and controllable in the hands of the groom that he can be exercised and led to service with comfort and safety to himself, the mare and the attendant; a saddle horse must be willing to be mounted quietly, be bridle-wise and always ready to take the gait desired by a capable rider; the harness horse must be kind and steady at the various unexpected sights and sounds of the public highways; the draft horse must find pleasure in "collaring" heavy loads and working long hours; the unbroken yearling, or the broncho just roped on the plains, has manners enough, if it is not vicious.

As horse shows are intended to educate the people in the knowledge of the good qualities of the horse, and to stimulate the breeding and development of good animals by the awarding of prizes to those which best conform to a proper standard of merit, it is essential that the judging and awarding of prizes should be done with intelligence and fairness by those who are thoroughly competent.

In the many classes into which horses are divided, according to the use for which they are intended, it is necessary that judges should be selected who have both a general knowledge of all races of horses, and a special knowledge of the class for which they are selected.

The judges estimate the type, conformation, quality and manners of the animals, receiving them with certificates from the vet-

erinary inspectors, who have only to do with the soundness of the animals.

Notwithstanding American custom of bringing in the Veterinary judge last to support or conflict with the opinion of the other judges upon some specific point, his place should be an initiatory one, as it is in the old country. All horses before entering the show ring should have been examined, for the satisfaction of the owner, by some reputable veterinarian. This, in ordinary cases, protects him from disappointment, and prevents the entry of horses which are not eligible for competition from unsoundness. The veterinary inspectors of the show should examine the animals in separate paddocks, where the inquisitive and meddlesome outsider is not admitted, and they should furnish a written certificate for the judges, which should accompany each animal, and which should be final. The veterinary examination is based, as it would be in private practice, upon the destination of the animal. A breeding animal may be broken down or have serious blemishes which would unfit it for work, but it must be free from hereditary unsoundness. Custom has established the hereditary diseases to be the following : roaring, whistling, ringbone, spavin, navicular disease, cataract.

In the utility classes, while, of course, an absolutely clean sound horse, should always take precedence over one which has, blemishes, yet animals with blemishes which do not, or are not liable to produce lameness or interfere with their usefulness, can be passed as practically sound or serviceably unsound, and be considered for competition.

When the horse has passed the veterinary examination and received its certificate of soundness, it goes before the regular judges, who should accept the certificate, and have only to do with conformation, quality and manners, and such specific conditions as are called for in the various classes by the prize list.

The judges of horse shows in America have, at various times, been selected for very arbitrary reasons—presumably they should always be selected for their experience and competence—but unfortunately there is often a rich stockholder of a county fair who is flattered by being considered a horseman, and who repays the compliment by settling the society's deficits ; or managers of shows take greater interest in their personal friends than they do in the public good ; or a social element enters, and a gentleman recognized for his integrity, whose knowledge of horses is based solely upon the type of his own horses and those of his friends, who be-

long to the same riding or driving club, is appointed in preference to the man whose experience and ability has been acquired by a life of practical horsemanship or of veterinary practice, which has trained him to recognize the qualities of all classes of horses, whether they are ideals of his own type or not. The large American shows have, however, shown a decided improvement in the last few years in the selection of judges, and the veterinary profession has been recognized by the selection of Professor McEachran, of Montreal, and Professor Smith, of Toronto, as judges in a number of classes.

With the increasing number of classes of animals for which prizes are given, and the growing volume of good animals entered for exhibition, together with the host of "crocks" who find entrance to shows through the vanity of their rich owners, sufficient time cannot always be had for complete inspection, and it is often bewildering to pass many animals rapidly in review and attempt to remember their various qualities. Even with a small number of animals in competition, no man can accurately remember the details of conformation and quality upon which he should base his comparison of relative merit, and the most conscientious and honest of experts, when he attempts to carry the *ensemble* of an animal in his mind, must be more or less governed by his own prejudice or predilection in favor of some type or resemblance to some animal which has been a paragon in his own stable, or past experience.

For accurate, unbiased judging, especially when a number of animals are in the competition, a standard should be established and a scale of points should be used by which each detail, and the aggregation of details, may be estimated, and thereby a definite result reached. This method of judging renders the work much easier and more rapid for the professional judge, and both educates the novice or amateur and leads him to learn the points he should look for.

The following is my own scale of points, which I recognize to be incomplete, but which I am glad to bring before the public, inviting its criticism and asking for suggestions in order to perfect it and make it more useful. It will be seen that in 100 points, 60 points are allowed for conformation and 40 points for quality and manners, which allows the judge ample latitude for generosity to his own expert appreciation and personal opinion.

By grading the judgment on a scale of 5 for perfection to 1

or 0 for very bad, and multiplying the value, it will be seen that the perfect horse would be marked with 500 points, and others attain their relative place.

SCALE OF POINTS IN 100.

		Value in 100.	Revised Value.	Degree of Perfection.	Definite Value.	Remarks
				1-5	Total 500	
Head	Conformation 60	4				
Neck		2				
Shoulder		6				
Arm and Forearm		2				
Anatomical foot		6				
Knee to pastern, anterior. Be- low hock, posterior.						
Surgical foot.....		10				
Hoofs, anterior and posterior.						
Body.....		10				
Croup.....		6				
Thigh and Lower Thigh.....		4				
Hock		10				
Quality.....		25				
Quality proper.						
Action fore.						
Action hind.						
Pedigree.						
Manners		15				

MODIFICATION OF SCALE.

It will be readily understood that the various parts have not the same value in all classes of animals, and the blank second column and column of remarks are inserted for adjusting the table to the classes under consideration.

Head (value 4). In breeding classes the head is important as an evidence of race type. It is essentially so in all of the primitive races, as the Oriental horse (Arab, thoroughbred, Barb); the Irish horse (Shetland, Breton); the Shire; the Dutch horse (Clydesdale); the Danish horse (Normans, Luxembourg). In families of mixed race, like the hackney, the standard-bred trotter, etc., it is of considerable value as indicating the predominance of ancestry in the formation of the *family*. In common horses its value is included in quality according to the amount of intelligence shown.

Neck (value 2). The neck is given a value of two points only, as the estimation of its conformation must always be subservient to that of the head and withers, which it joins.

Shoulders (value 6). The shoulder, including the withers, in many cases, demands a greater value than the six allotted to it.

The speedy race horse or trotter or the high-stepping hackney demand more value for this part. The saddle horse requires more consideration for the withers than the ordinary harness horse.

Arm and Forearm (value 2). These are given but little value, as they are subservient to the shoulder and their aplomb is dependent to a certain degree upon the foot below.

Anatomical Foot (value 6). The value of the anatomical foot is based upon the conformation, aplomb, relative angles and soundness of the knee, cannon bone, splint bones, tendons behind the shin and of the fetlock and pastern.

Surgical Foot (value 10). The hoof must not only be good in itself, but must be adapted to the animal it carries, and ten points are none too many for any animal which is to perform work or be used for a breeder.

Boay (value 10). The barrel, like the feet, in any horse must be good, as any defect interferes with the function of respiration or diminishes the space for food.

Croup (value 6). This value is none too great in pure races, where it is an evidence of race type, and is given this value in speedy breeds, although in the latter we may find fast horses with all forms of croup. The set of the tail is a race characteristic in some animals (Shetland, Hackney, Shire), and is of value in all better bred horses and animals of luxury, where it is an ornament.

Thigh and Lower Thigh (value 4). These, like the arm and forearm, are dependent, to a great degree, upon their relations to the structures above and below, but have much individual value of their own.

Hock (value 10). While this part deserves the full valuation of points given to it, it is the one which will most rarely be accorded its full number, and care should be taken not to award the decimal to any but the most perfect of bold, strong joints, which should never go wrong.

Quality (value 25). Quality may be subdivided into : Quality proper, action of fore legs, action of hind legs, pedigree ; and, according to the class of animal examined, a certain part of the 25 points may be accorded to each. So an animal in a high-stepping class may have 8 for action fore, 8 for action hind and 9 for quality proper, while a thoroughbred stud horse can have 10 for quality and 15 for pedigree. Quality must be most variously interpreted. The peacock head and tail, rangy action and pride of pose of Mambrino King, Bonfire or Bersecker shows quality very differently from the resolute, firm, steady movement which indicates

it in a draft horse or mule, but it is of as much value in the latter as in the former.

Manners (value 15). Manners in trotting classes and in work classes may include the record of performances where the conditions of the competition call for them. The manners of a stud horse are to be easily handled. The manners of a car horse are to keep his neck in the collar and drudge willingly. Young animals are not expected to have any. Some animals, therefore, should have half or more of the 15 points taken off of manners and added to conformation. On the other hand, the four-in-hand team, the pair to a lady's spider, the park hack, or the hunter must be given full credit for them. *

DIFFERENTIAL DIAGNOSIS BETWEEN OSTEO POROSIS AND RHEUMATISM IN HORSES.*

BY JAMES D. HOPKINS, V. S.

During a practice of twenty-one years I have met many veterinary practitioners, on cases where the ailment presented symptoms which made it exceedingly difficult to make a differential diagnosis, unless careful attention is given to the history of the case, and a complete knowledge of the peculiarities of both diseases are carefully considered.

About 18 months ago I was called on to examine a black mare, 6 years old, and could find no cause of unsoundness. After every drive of any distance this mare showed lameness, sometimes in front, at other times in the hind extremities, which under appropriate treatment disappeared.

The owner, becoming tired of the continued annoyance, another veterinarian was called, who pronounced the disease rheumatism. This mare did not present any external evidence of osteo porosis. There was no enlargement of the bones of the face or lower jaw. In the joints, where the lameness occurred, there was no swelling; there was heat, but not painful on manipulation. The distance driven determined the amount of lameness, either light or excessive. Her appetite was poor, pulse and temperature elevated.

Six months later this mare, through a change in owners, again

*Read before the New Jersey State Veterinary Society.

came under my observation ; and now the external evidence of osteo porosis was very plain in the enlargement of the bones of the face and lower jaw. My treatment of this mare was mineral tonics, diuretics, and local applications to affected joints.

Another case, worthy of mention, was a grey draft horse, 8 years old, who, while standing with his mate hitched to a heavy truck, grasped with his teeth the pole of the wagon with such force that the three upper incisors on the right side were turned up and outward.

This horse had been gradually losing his gait; appetite poor; but had been kept at his work. He was in good condition; pulse normal; temperature, $100\frac{1}{2}$ Farh. The ramus of the lower jaw was fully two inches in diameter; the bones of the face much enlarged; but, being a healthy horse, the owner supposed it was natural.

This animal was not treated, as I thought the case hopeless, and he gradually declined until, about six months later, when from the ravages of disease, emaciation, and loss of strength, he was unable to arise from the recumbent position without help, the owner destroyed him.

Osteo porosis is an insidious disease, progressing slowly but surely, and generally the first thing noticed is the lameness. This will be recurrent; also metastatic in character. Sometimes the lameness will be slight, again very severe. The veterinarian will be at a loss to account for it, unless he examines the animal for constitutional disease. The horse may for a long time perform his daily task, and look thrifty unless exposed to hardship. In some cases there is a gradual loss of gait—stiff when compelled to turn short around; capricious appetite; unthrifty appearance of the coat; easily fatigued; the bones of the face and lower jaw are enlarged; pulse and temperature is elevated; grave changes take place in the integrity of osseous structure, and, with the constitutional disturbance, emaciation rapidly follows, and the end is soon brought about through exhaustion of the vital forces, unless the owner humanely ends the suffering.

This disease affects all classes of horses—the carriage horse as well as those used for draft; among horses kept in palatial stables, where every attention is given to sewerage and ventilation, and fed on the best food obtainable, as well as among those that are poorly housed and kept.

Some years ago, when this disease was first observed among the horses of this country, it was attributed to their feeding on hard

corn, and was named "Big Head !" It has been demonstrated that cattle and sheep are also great sufferers from this disease.

The treatment of osteo porosis is very unsatisfactory. Remedial agents seem to be futile. If the horse, in the early stage of the disease, can be turned to fresh grass for a few months, he will in most cases return in fair condition, and do service for a long time.

For the morbid anatomy of osteo porosis, I refer you to Prof. Williams' "Principles and Practice of Veterinary Surgery," page 184.

Prof. Robertson, in his "Practice of Equine Medicine," gives an excellent account of the rheumatic form certain cases of influenza assume :

"In influenza our patients are at times afflicted with a rheumatic complication, in which the serous and fibro-serous textures of joints and tendons are swollen—hot, tense and tender on manipulation; the lameness is great, and the temperature, pulse and respiration increased. This condition is metastatic, attacking in some instances all the limbs in the course of a few days. This disease readily yields to remedial agents, the patient making a good recovery." Quite a difference from the insidious ravages of osteo porosis !

Again on page 238, Prof. Robertson describes acute rheumatism as attacking the same tissues as in the above form, admits of its heredity, and spontaneous origin when the animals are exposed to certain atmospherical and telluric influences ; and he also admits that young stock are more frequently affected than adults.

The joints and other situations of the limbs, which are the seat of local inflammatory action, are swollen, hot and tense; also capsules of joints and sheaths of tendons. There is a deranged condition of the intestinal canal, and the usual elevation of temperature, with a frequent, full and unyielding pulse. The extension of the inflammatory action to the heart and its appendages, give rise to another series of symptoms, as restlessness, anxious expression of countenance, sometimes a cough, difficulty in respiration, and palpitation when caused to move rapidly.

But the lameness is the attractive symptom, and it is sometimes severe and sudden,—it may affect one limb or two at the same time. Swelling of the affected member does not seem to give relief from the pain, which is so great, that when the animal is forced to move, it causes the animal to perspire freely.

Prof. Robertson and Prof. Williams, both standard authorities on veterinary matters, state that rheumatism generally affects grow-

ing stock, when they are exposed to inclement weather, or housed in damp stables, or raised on low lying farms; and rarely affects adult horses, except as a sequel to some inflammatory disease.

Now, gentlemen, after mature consideration of the differential symptoms presented in the horse, when suffering from osteo porosis, and the descriptions of symptoms of rheumatism, as furnished by standard authorities, and after a practice of twenty-one years among horses, I am obliged to confess that I have never seen a case of rheumatism in the adult horse, except as a sequel to some febrile complaint, in the form of rheumatic arthrites.

BRONCHITIS IN DOGS.*

BY R. L. TUCKER, D.V.S.

The subject which I propose to bring before you to-day is one which is sometimes met with in the practice of Canine Medicine, which our authors of text books seem to overlook or, in fact, I may say, almost entirely neglect. For it is a sad fact that there is not one text book to-day on Canine Practice that is fit, I may say, to adorn our Veterinary Library. But through careful manipulation and research, I will this afternoon bring before you one of those many diseases known to us in the aforesaid practice, namely, that of *Bronchitis* and its different forms. Its name is almost entirely sufficient to discuss not only its action but the parts affected thereby. The word is derived from two Greek words, viz.: *Bronchæ*, meaning bronchial tubes, and *itis*, an inflammation.

In short, bronchitis is an *itis* of the mucous membrane, lining the bronchial tubes both large and small. When affecting the former it is known as simple bronchitis, or bronchitis proper. When affecting the latter it is known as bronchitis capillaris, or capillary bronchitis. There is also another form of bronchitis, viz.: *Bronchitis Verminosis*, or an affection produced by the germs known as the *tæniæ eliptica*, which in this last disease are usually found in the part of the small intestine known as the jejunum. But of this we will speak later on.

* Read before the New Jersey State Veterinary Society.

Causes.—Bronchitis is an affection to which dogs are more or less liable.

It may and does exist as a primary, or secondary disease; in my opinion, more so as the first. When it does exist as the latter, or secondary, it is generally in company with catarrh or any disease affecting the respiratory organs, and we will at once class it under two heads, viz.: Acute and Chronic.

The causes which operate to produce the former are the same as those which tend to cause a continuance of the latter, only they are very much aggravated, viz.: cold, damp atmosphere. The inhalation of obnoxious and irritating gases, neglected or protracted diseases of the respiratory organs, such as catarrh of any of these organs, and of course an extended and prolonged *itis* of the surrounding tissues, and finally the afore-mentioned *bacilli* producing that disease known as *Verminous Bronchitis*.

Symptoms.—The symptoms in the dog are very closely allied to those which are met with in the human subject, which, I no doubt, some of you have witnessed for yourselves.

These symptoms, whether well marked or obscure, will entirely depend on the amount of tissue involved. If the malady is only confined to the larger tubes and their branches the breathing will be less disturbed than when the subdivisions are involved, particularly the smaller ones. The cough in the former will also be less frequent, but louder and more sonorous, but with little or no expectoration. This form, however, is rarely witnessed in the canine; if so, it has passed to the more complicated form before the veterinarian arrives, or one is called, as from four to twelve hours is ample time for the tissue to make the change. I shall, therefore, describe the more general symptoms of the acute stage.

The respiration is hurried and labored, the breath may be, and as a rule is, very hot, but I have seen exceptions to this rule more than often showing only the low state of the system; the breath has almost been icy cold, more especially marked a few hours previous to the dissolution; “for do not let us overlook the fact that bronchitis in the dog, more so than in any other animal, is excessively fatal.” There is an almost incessant wheezing cough, which finally becomes short and dry, followed by expectoration and vomiting; this last symptom, viz., vomiting, is easily accounted for when we take into consideration the *itis*, as a rule, will extend from the tubes far up along the trachea and even into the larynx and pharynx. The expectoration, I have marked on several occasions, to be similar to that of pneu-

monia in its last stages, viz.: that (prune juice) expectoration making me at times doubtful of my diagnosis, which was always verified either by recovery or an autopsy after death. It is usually frothy and not infrequently mixed with blood due to the laceration of one or more small capillaries or arteries in the act of violent coughing or retching. The eyes are very red and the conjunctivæ inflamed, the point of the nose dry and hot, mouth devoid of moisture, tongue parched and showing the appearance of brown fur (another symptom seen sometimes in aggravated cases in man). The pulse is quick and small and the heart's action very jerking. In most of the cases that I have seen the pulse at the pad of the foot was almost imperceptible, while that at the thigh was very plainly felt. I have also been able, in most cases, to get a pulse in one hind foot and not in the other, and in the opposite fore foot to that of the hind where it was felt, showing a very disordered and uneven circulation. On auscultating, the heart emits a thumping noise, but above this can be always distinctly heard the diagnostic mucous rale or rattle of the disease in question. A thin mucous discharge generally sets in at the onset from the nasal organs which, as the disease progresses, becomes copious and muco-purulent and is generally accompanied by violent sneezing, and I have seen cases where this sneezing was so continuous that it would produce nervous prostration, from which the animal would never recover, but die in convulsions. As the malady advances all the above symptoms increase in severity and the final termination is resolution of the parts, which is easily discernible by the diminishing of the fever. The discharge that was heretofore purulent, or muco-purulent, becomes naturally mucous and clear, and loses the pruny smell. The appetite, which was greatly impaired, returns by degrees. The urine that was very dark and scanty becomes lighter and more profuse. The rale ceases to be heard, the pulse resumes natural pulsation, and everything in general proceeds toward recovery; if such is not the case the animal dies either from sheer exhaustion (acute inflammatory fever), or from asphyxia.

The chronic form is usually a sequel of the acute form and more generally met with in animals advanced in years. It very rarely leaves the animal but becomes more or less aggravated, according to the mildness or severity of the changing seasons. The symptoms are invariable, the cough is of a husky nature, brevity of respiration increasing with exertion, expectoration and retching.

This form may and is sometimes confounded with *phthisis*,

from which it must be distinguished by the absence of hectic fever, and of the physical signs that are characteristic of the latter, some of which I will herein state, viz.: In bronchitis we are not met with that, "as it is described by some authors," sometimes cough neither do we find, as a rule in bronchitis, the emaciated animal that we have in phthisis. The fœtid or gangrenous breath which we have in phthisis does not accompany bronchitis. Diarrhœas are also present in consumption and not very often seen in bronchitis; and in phthisis the animal gradually passes away, so to speak, without a struggle, while in inflammation of the bronchii suffocation, producing spasms, is the general accompaniment of dissolution. In all these cases of chronic bronchitis it is more fully characterized by the formation of solid or tubular concretions of exudative matter within the bronchial tubes, forming, in some instances, to such an extent as to reveal on autopsy polypi in the bronchial structure.

"*Treatment.*"—Immediately symptoms of acute bronchitis are observed, it is advisable to place the animal in a moderately warm, sufficiently ventilated, and dry habitation. With regard to medicinal agents, some recommend from 1–3 grs. tartar emetic in proportion to the size of the patient, and say that it is at the onset very beneficial. But in spite of my knowledge of the diseases of the respiratory apparatus, knowing, as you all do, that they are, one and all, depletive diseases, owing to the amount of tissue involved and used up, by the amount of nervous force acted upon, that emetics or aperients, gentle or drastic, are entirely out of place and bad practice, and that a course of medicine entirely stimulative should be resorted to from the onset. Some authors, as Williams, Virchow, &c., recommend aconite as an antiphlogestic agent. Of course I am not here to base my authority against, or on par with their long experience, but simply to say that I have received just as good, and if anything, better results from equal parts of quinine and antipyrin than from aconite. The pulse is, as a rule, quick and weak; this can be subdued and strengthened by small doses of nitro-glycerine and digitalis alternately, with the regular fever mixture, made up of liquor ammoniæ acetatis, tinct. opii, a small quantity, and some of the alcoholic stimulants; I prefer brandy. If the cough is very hard and dry, a few drops of tinct. of belladonna and acid hydrocyanic will be found beneficial. I have also found that in the cases where sneezing is liable to produce exciting symptoms, doses of morphiæ acetatis, administered hypodermically, will allay it in most cases; if not, why

sulphuric æther inhalation will do the work, carried far enough not to produce entire unconsciousness.

As regards to severe emplastrum, such as cantharides, mustard and stimulating applications of turpentine, etc. I think these are entirely out of place, although often well recommended by expert veterinarians on "Canine Practice." Oiled silk and linseed meal poultices are all that are required. I would recommend the former; for by applying poultices, especially when performed by the laity, the sides of the animal are very apt to get chilled in the reapplication of the same. While on the other hand, the oiled silk can be at once applied, and simply an adjustment every two or three days is sufficient to keep it in place. From the susceptibility of the return of the attack, unnecessary exposure to the cold or damp weather should be avoided; and until a thorough restoration to health is established the animal should not be allowed to return to his natural and ordinary life.

Bronchitis Verminosis.—I will now endeavor, with your permission, to describe to you a small sketch of the pathology, symptoms and treatment of that other form of bronchitis of which very little is known, viz., that of "*Bronchitis Verminosis.*"

As I stated in the former part of this paper, that its one and only cause was due to a germ peculiar in and to itself. It is known as the "*Pentastomum Tanioides.*"

"*Symptoms.*"—Among the initial symptoms, loss of appetite and disinclination to exercise, together with unsteadiness of gait, amounting in some cases to a sub-paralytic condition of the hinder extremities were the most evident. In almost half of the cases convulsions occur. There is rarely diarrhœa or any other symptom referable to gastro-intestinal disorder, although a large quantity of the parasite is found along the intestinal canal. Cough is not a prominent symptom by any means, it being entirely absent in the majority of cases. When present it is short and husky, very much unlike the regular distemper or bronchial cough. The pulse and respiratory act are very much increased, the temperature elevated to $100\frac{1}{2}$ to 102 degrees F. Whenever food is taken it is, as a rule, vomited. Death takes place in most instances quietly, though sometimes during a convulsion, and as a rule, the pups which have the most convulsions hold out the longest. The duration of the disease is from 3 to 7 or 10 days; and in an epizootic, some months back, in Montreal it lasted about 7 weeks. In inquiring into those cases I found that all, with the exception of 3 or 4, were under 8 months old, and only one of the older dogs died, and it

was supposed that this death was due to accident. The hygienic surroundings of these kennels were not at all good. The disease showed itself during a very cold spell; indeed for the first 3 weeks, so I was informed, the weather was below zero. Post mortem examinations were held on several, and in all of them the same basis was found, viz.—this was a fox-hound bitch—on opening the thorax, the lungs were seen to only partially collapse the lower borders of the lobes were firm to the touch and very dark in color. The vessels in the lower mediastinum looked full, and the tissues along that region were extravasated with blood. The auricles, ventricles and pericardium were found to be normal.

After the removal of the lungs there was, upon insertion, the escape of a dirty brown, frothy fluid, through the trachea. The anterior and the middle lobes, the anterior half of the posterior lobes were completely solidified, and were of dark brown reddish color, and contrasted strongly with the normal parts. The pleural surfaces were smooth, with no signs of an exudation.

On section, the lung tissue was of a dark red color, the surface of the section finely granular, and bathed with a quantity of brown serum. The air cells were found to be filled with a solid exudation, and the lungs would fail to inflate when this was attempted, and between the healthy and diseased parts there was found a zone of intense hyperæmia. On slitting up the trachea, small swellings here and there, and within them were found bunches, so to speak, of small parasites. These are most abundant just at the bifurcation of the trachea and tubes, forming a mass 3 to 5 lines in height. The bronchial glands are swollen and enlarged. The stomach is generally filled with a dirty looking fluid. The spleen is normal, jejunum and ileum infested with the *tænia*. Liver firm and hard, and without an exception a clot in the portal vein. These are, as near as possible, the post-mortem appearance as I could gather from the information that I obtained from my correspondence with one of the professors of the Montreal Veterinary School.

The symptoms, as described by Prof. Conlin, are as follows: The animal is subject to convulsion, during which the animal is violently agitated, stops short, hits itself on the head, rolls over, rubs its nose on the ground, and the jaws are convulsively champed. It devours everything within reach, such as wood, straw, etc., discharges a large quantity of saliva, passes urine involuntarily, and sneezes without intermission. Death, as a rule, ensues. The mucus vent of the nose is found to be red ecchymosis, thickened

and ulcerated, the sinuses more or less filled with pus, and in some cases the ethmoid bone has become carious.

The treatment is very unsatisfactory, simply the inhalation of irritating gases, such as super-chlorine, sulphur, etc.

59 E. Front Street, Plainfield, N. J.

ACUTE TOXIC ANÆMIA.*

Was it caused by the *Coleosporium Solidaginis*, Thumen.
(Scheinmitz.)

BY DR. JACOB HELMER.

In the month of September, 1891, we received a call from Messrs. Simpson and Clelland to go to their stock farm situated at *Lake Ariel*, in Wayne County, Pa. My brother, R. C. Helmer, received the call and hastily took the last train that day (Saturday) to the lake. On his return that evening he called my attention to a very interesting case.

The patient was a very valuable brood mare, *Lady "Mac-Gregor,"* age seven years, fifteen hands high, and bay in color.

The case was found standing in a loose box ; she was eating some grass that had just been given her.

The first thing noticed was her emaciated condition. The animal was reduced to skin and bones. On examination the pulse was found to be very frequent and weak. The impulse of the heart walls beating upon comparatively empty cavities could be heard a few feet away.

The respirations were increased, temperature slightly sub-normal, visbile mucous membranes pale, almost white, extremities cold. On motion (from the muscular debility) the animal reeled and appeared as if she would fall. There was no pain, no uneasiness. But there was thirst and a ravenous appetite. The kidneys and bowels both performed their functions normally.

On inquiry into the history of the case, it was found that the animal, with others, had been in the pasture field all Summer.

* Case reported at meeting of Pennsylvania State Veterinary Medical Association, March 7th.

Sometimes the animals would not be closely inspected for days at a time. This was because they could be seen at a distance from the barns. But on a visit to the animals in that field it was at once noticed that two of the mares were considerably emaciated, especially the one mentioned, "Lady MacGregor." These two were immediately removed to the barn. Five days before this these animals appeared in good health. Three others in the same field were apparently not affected, and one other horse that had just been turned into the field was not affected.

This was the history. In the case of Lady MacGregor it was apparent that she would not live long. She died the following day, *Sunday*. On Monday morning I went to see the cases and made a post-mortem.

The morbid anatomy was as follows: Body emaciated, voluntary muscles, pale color, all the internal organs very pallid, the serous surfaces dull and wrinkled, heart diminished in size, pericardial fluid diminished, fatty tissue diminished, cavities almost empty, muscle substance of a pale color, and flabby feel.

The lungs were crepitant and pale, at the base a slight oedæma. Liver normal in size, but pale. The gastro-intestinal tract was pale, but studded here and there with ecchymotic spots. The spleen was apparently normal, in size and slightly friable. The lymph glands seemed normal but were not well examined. The brain substance presented a very anæmic appearance. But nothing further was noted. The kidneys presented nothing special. The genital organs the same. The large blood vessels were normal in appearance, but, like the heart, almost empty. The want of blood in the system was a prominent characteristic of the post examination.

It now devolved upon me to give an opinion of the cause of the animal's death. The symptoms produced and the animal's death was decided as probably being caused by a poison that was being taken into the system either through the water or food supply.

As animals in adjoining fields, that drank the same water, were not affected, the idea of the trouble being possibly caused by the water was rejected. But if it were in the food, then the poison must flourish in the field, as that was the only source of food to these animals. One thing was noted. The pasture ranged alongside an undergrowth of woods, into which here and there the animals entered for shade.

The woods, therefore, were first thoroughly inspected, but nothing suspicious was found; nothing there seemed to have been

eaten. Even the branches of the bushes were scarcely touched.

Next we turned attention to the other animals in the field. As before stated one of these had already been taken to the barn, but was not in an advanced stage like Lady MacGregor.

The animals still in the field (excepting one which had just been turned in) were affected. The symptoms varied merely in degree. But in each case the pulse was frequent and weak, visible mucous membranes pallid and body emaciated.

In coming to the part of the field where these animals were standing, an abundance of the low variety of the golden rod, *solidago odora*, was all along noticed. My comrades informed me that it was very common throughout the entire field. It was subsequently found to exist liberally on all that side of the farm, an extensive tract. Also upon other farms in that section of the country.

But a peculiarity was noticed in connection with this common plant. It was loaded with a reddish rust. This rust I had often observed, but never before the quantity.

I also knew that horses are not fond of the golden rod, but could find in the fields nothing else to suspicion. However, it was thought best to offer these cases some, and thus determine whether they would eat it or not. Having selected some specimens that were laden with the rust and devoid of admixture with grasses the collection was offered.

The affected animals eagerly devoured it. I had some choice specimens in my coat pockets. These were betrayed by the peculiar odor and were nosed after just as eagerly as if it had been sugar or apples.

The next thing was to offer some to the one animal that was not affected. This gentle fellow would not accept it, but laid back his ears and wheeled on me. However, on approaching him again he accepted grasses from my hand, but not a particle of the weed. *Here, then, was an interesting and noteworthy fact.*

Specimens were next offered the patient in the barn; these were at once devoured and desire manifested for more. Unaffected animals (on other portions of the farm, but where the rust weed existed only in limited quantity) could not be induced to take a mouthful.

The affected animals were now ordered to the barn. The unaffected one was sent to another field.

The patient taken out of the field at the same time with Lady MacGregor was now, for the first time, examined by me.

It will not be necessary here to repeat the symptoms presented, as they were the same presented by the MacGregor mare and already described. But they differed in degree. They were not so severe, but yet severe enough to warrant an unfavorable prognosis.

The hygienic treatment adopted was plenty of fresh air, also good food and plenty of it. In the way of medicines, tonics were administered, also peroxide of hydrogen subcutaneously.

The other cases were merely given good food and tonics.

One peculiar symptom, in addition to those previously mentioned, was an occasional sinking spell on the part of the animal most affected.

These patients all recovered in time, but it was many months before the symptoms wholly disappeared.

Now we come to a consideration of the plant and peculiar rust upon the *solidago*. The plant is widely distributed. It is comparatively harmless. In fact is useful. It is described as being stimulating, diaphoretic, carminative, etc. Some drink the tea and esteem it. But it is not officinally recommended as a remedy. Horses do not like it.

But why did these horses crave it? It was craved for the rust's sake; an appetite had been acquired for it. The taste once accidentally experienced, the animal easily acquires the habit of eating it. It seems to have been brought about in this way: The Summer of 1891 was peculiar, in that there were, especially in highland regions, a succession of showers followed by hot sunshine. This condition peculiarly favored the development of all kinds of vegetable fungus. As a result of this, there was an abundance of rust upon the *solidago*. In the fields mentioned there was an unusual amount of the golden rod. It was fallow ground and bore more than the usual quantity found in other fields.

The rust spores fell from the *solidago* upon the succulent grasses underneath. It was easily taken into the system with these grasses. Once in the system it excites a morbid appetite. The afflicted animals recognized and sought for it. The more the system came under its influence the more was it craven; after the manner of the habitual drunkard.

The rust is a vegetable fungus. It is the *Coleosporium Solidaginis*, Thumen (Scheinmitz). The fungus consists of colonies of microscopic vegetable parasites. These, to be appreciated, must be studied under a powerful microscope.

Of its propensities nothing is known. There has been no

chance to know anything ; no experiments having, to our knowledge, been tried. It has been thus far in the hands of scientific men who pay attention, among other things, to the naming and classification of nature's appearances in rust and fungus. But it is a great work. It prepares the way for the discovery of the nature and powers of these peculiar products.

We little dream of the possible virtues of the vegetable fungus—thousands of species that have only been named, but of whose properties nothing is known. If we reason by analogy, from the few we know, it is not far to see that these products may revolutionize present remedies and take their place. Among the few we know is ergot. It is an example of the power of that class of remedies.

But while there is nothing known of the poisonous properties of the *Coleosporium*, while it is only one of thousands of which we are ignorant, yet there is nothing to show that it is not a poison. There is simply nothing on record. If it can be conclusively shown that the cases herein described were due to other causes, then it does not prove that the *Coleosporium* is not a poison or that it may not have a powerful effect upon the animal economy. But if it cannot be shown that the symptoms occurred otherwise, or if it can be demonstrated by experiments that the fungus taken into the system will produce the same or similar symptoms, then we have had under consideration a hitherto unknown poison.

It is for this purpose I present this paper to you to-day. To elicit discussion and obtain information and experience that will either cause the idea to become established or be displaced by better knowledge.

But closer examination of better specimens of the rust than at first examined, revealed that the *Coleosporium* was itself infested by a second parasite.

The *Dlarluca filum*, castagne (iv.) This parasite belongs to a more poisonous company, but of its actions or properties nothing is positively known. It is open for investigation. It is known to be a poison, but not what kind of a poison. But the idea of its being a poison being a fact, and it infesting the *Coleosporium*, strengthened my idea that I was dealing with the mischief-maker.

Accordingly I began some experiments. I could not (at the late hour I undertook it) collect enough upon the specimens with which to feed an animal. I could not get an animal in time, and by the time I had secured one the frost had killed some of the specimens. We then collected some fine specimens and carefully

scraped off the rust. This was placed in a common porcelain mortar and rubbed up in water. It made a reddish, yellow-looking fluid. This was carefully sealed and set away.

Our first experiment was upon a dog. The hypodermic syringe was first cleansed in boiling water. Then 40 drops were injected under the skin. In one quarter hour the little fellow begun to show signs of intoxication. He could not walk without falling over, so he chose to sit or lie quiet. These symptoms lasted about two hours, then passed away, but not without leaving the animal more dull and weak.

No symptoms of pain were noticed. The appetite was not impaired, and the next day the dog appeared all right. As I did not wish to destroy this little pet it was excused from any more experiments. I was convinced that I was dealing with a deadly poison.

We next secured some large rabbits. The first one was given two drachms of the fluid. It died in five hours. It was thoroughly dazed until dead. It showed on post-mortem a pale and flabby appearance of the internal organs. That the blood corpuscles had been interfered with, and that a profound anæmia was being produced, could not be doubted.

Other cases were not injected so freely; 10 drops were administered 3 times daily. To one 10 drops were given once daily. The animals all died, but in varying intervals of time. The appetite in each case remained good until toward the end. But rapid emaciation was apparent in each case, the animals surviving but from 3 to 5 days only. There was a steady decline of the vital powers, and the animals were still alive after they were too weak to move about.

In each case a post-mortem examination was made and the symptoms seen in the horses were verified. There were but insignificant difference in the gross appearances. In no case were there any symptoms of pyæmia or septicæmia. These experiments were made carefully upon six rabbits and one dog.

It is admitted that the method of experiment of hypodermic injection is open to criticism. We employed it as a test merely because we could not test it in any other way. The experiments were simple, but were very carefully made. They yielded results which, if it can be said do not positively prove the poisonous character of the *Coleosporium Solidaginis*, yet they no doubt materially strengthen the position first assumed in this paper. It remains and it shall be done this season to collect enough specimens and feed

them directly to a horse. This method will exclude any possible chance from error.

In regard to the treatment of such cases it is impossible to prescribe intelligently. When we do not know a poison sufficiently, we do not know how to combat it. We can only simply follow the indication of nature and build up the system. The vegetable fungus probably enters the blood and, as a proximate principle, becomes a part of the same. Hence it is difficult to attach it. In the cases outlined here it appears to have fed upon the blood corpuscles faster than they could be restored by nature and a vigorous appetite. Probably there was also influence exerted to prevent the formation of new corpuscles. At any rate the blood was very rapidly consumed.

I am indebted to Dr. H. H. Rusby, of New York City, for information regarding the name of the fungus and its known history. Also for the encouragement given me by that learned medical botanist that the simple fungus before us was probably the cause of the mischief described.

SCRANTON, Pa., March 5, '93,
311 Spruce Street.

FUNGUS HÆMATODES IN CATTLE AND HORSES, WITH NOTES ON CASES IN PRACTICE.*

BY JAMES A. WAUGH, V.S., Allegheny, Pa.

Fungus hæmatodes, or encephaloid cancer, affects the orbit and contiguous parts, and occurs occasionally in cattle, horses and all classes of domesticated animals in all parts of our country. However, it is seen most frequently in the warm climate of the Southern States, and more especially in the Rocky Mountain country and in the States and Territories bordering on Old Mexico. A positive diagnosis may prove exceedingly difficult during the early stages of this disease. The first symptoms observed are usually an inflamed and watery condition of one eye, with evidence of considerable pain manifested by the patient being uneasy and elevating and depressing the head occasionally, and at other times stand-

* Read before the Pennsylvania State Veterinary Association.

ing with the feet widely apart, and drooping the eyelids and hanging the head. There is considerable pain, which causes sleeplessness and gradual loss of condition. The owner, or attending veterinarian, will readily realize that the patient is suffering from something more serious than ophthalmia, and will likely examine the teeth for caries and the ears for parasites, but will find no evidence of disease in these organs. Ordinary ophthalmic remedies may palliate the suffering and temporarily mitigate the virulence of the disease; yet it will progress gradually and finally develop into a cancerous tumor with an irregular surface, which bleeds readily on irritation or excoriation, and emits a characteristic odor which is very offensive, especially during warm weather. The tumor may involve any part of the orbit or contiguous parts, and sometimes the contents of the foramina are affected beyond the reach of the surgeon's scalpel. I have observed that this disease develops very slowly during the early, and very rapidly during the later stages of its existence. The alteration in the eye, and surrounding structures, may be only very slight or very extensive; evidently much depends upon the length of time and the malignancy of the disease. These tumors are a source of much annoyance to the unfortunate patients, and cause so much suffering that the animals frequently rub the affected parts against obstructions, which causes free hemorrhage and large granular sores.

Causes.—Severe and neglected ophthalmia; accidental local injuries due to shipping in cars or other modes of transportation; play or quarrels among live stock; stings of insects or reptiles; continuous exposure to rays of hot sun; change of climate; drinking water charged with an excess of alkaline salts; also exposure to piercing winds and sand storms. A cancerous diathesis appears to exist and develop in certain families of mankind and the lower animals, which is well worthy of investigation and further study.

Treatment.—Cast and secure the patient by proper arrangements, and administer local or general anæsthetics. Early extirpation of any tumor or tumors that may develop on the inner surface of the eyelids or canthus, or on the membrani nictitans, and include a small amount of the healthy with the diseased tissues in order to insure complete removal of the cause of the trouble. Dress the wounds with modern astringent and antiseptic remedies, and apply proper dressings and bandages. These mild cases generally recover after this form of treatment. The eyeball is frequently involved in the diseased process and must be extirpated with all

surrounding tissues included in the orbital cavity; then apply a heated bulb cautery iron to the surfaces of the wound; pack the cavity with marine lint or absorbent cotton, saturated in some antiseptic lotion; dress with bandages. Remove the lint or cotton in about fifteen or eighteen hours; then wash twice daily and dress with astringent and antiseptic lotions; cover lightly with cotton cloth to prevent annoyance from dust or foreign substances and insects. Feed moderately and exercise regularly during convalescence. I treated a case in which the tumor had evidently developed from the posterior part and periosteum of its wall, which caused degeneration and destruction of the walls of the orbit, and the main body of the tumor was forced into and lodged in the frontal and superior maxillary sinuses on the affected side of the face. Trephining was necessary in the treatment of this case, which was very interesting and will be mentioned in my notes. There may be alarming and extensive hemorrhage during the operation, but this should not deter the surgeon from completing the operation in a thoroughly scientific manner as described.

CASE NOTES.

No. 1. Large black mare, age seven years, and in good flesh, was brought to our place during the autumn of 1882. This was the first case of fungus hæmatodes that I had seen in the horse, and my brother—W. J. Waugh—and myself had just obtained our veterinary degrees that year, and had a penchant for surgical operations. We cast and secured the patient with double side-lines; then removed from the right costal region a tumor about the size of a walnut; also from the middle part of upper lip a tumor about the size of a hickory-nut. We next turned our attention to a very large and unsightly tumor, involving one entire orbit and surrounding tissues, which, when removed, weighed a trifle over four pounds. We passed crucial sutures through the main body of the tumor and knotted loops, which were used instead of tenaculums, then dissected the diseased skin away from the side of the face and used a curved bistoury for removing the diseased mass from the orbital cavity. We were very careful to observe Prof. Laws' advice to remove, as far as possible, all the diseased tissues, but we concluded to use only the potential cautery, then dressed the wounds with astringent and antiseptic lotions, and filled the orbital cavity with marine lint, secured with sutures and bandages. The packing and dressings were removed in fifteen hours, then the wounds were washed and dressed twice daily. The patient con-

valesced nicely for about forty days, and was then returned for further treatment, as the tumor had reappeared and refilled the orbital cavity. We then resorted to the actual cautery, followed by proper dressings. The patient recovered and remained apparently sound for over two years and raised two good colts, and has been used as a brood mare up to the present time. The tumor fills the orbital cavity about once every two years, then a country medical doctor resorts to the treatment which proved successful with us. The colts have remained healthy to date.

No. 2. Ordinary and middle-aged cow, affected with fungus hæmatodes of the inner surface of the upper eyelid. Treatment: Same as recommended in article. Result: Permanent recovery.

No. 3. Medium-sized draft mule, affected with small fungus hæmatodes tumor about size of walnut, protruding over the eyeball and attached to the inner surface of the upper eyelid. Treatment: Same as mentioned in article. Result: Complete recovery.

No. 4. Draft mule affected with fungus hæmatodes, involving the membrani nictitans. Treatment: Removal of the diseased mass as indicated in article. Result: Rapid recovery and return to usual work.

No. 5. Cavalry horse affected with fungus hæmatodes tumor about the size of a hazel-nut growing from inner surface of lower eyelid. Treatment: Removal of V-shaped mass; wire-sutured the wound and dressed as usual in similar cases. Result: Rapid recovery.

No. 6. Cavalry horse affected with inflamed eye when received at military post in New Mexico. I supposed this horse had been injured in shipping. Treatment resulted in marked improvement, and it was assigned to duty to a camp in the field. It was soon returned for treatment. The patient evinced signs of suffering from much pain, and I presumed the trouble was probably due to the sting of some insect, or the rays of hot sun, or exposure to sand storms. The patient was treated occasionally, and kept under observation for about two years. I finally diagnosed the trouble to be a neuromatous tumor affecting the nerves of the eye, and recommended the horse to be condemned and sold. I saw and operated on this horse some eighteen months afterwards in southern New Mexico, and found the fungus hæmatodes tumor located in the frontal and superior maxillary sinuses, as stated in article. Result: The weather was extremely hot, and the treatment proved so tedious and disagreeable that the owner became discouraged and destroyed the animal.

No. 7. The writer and his student, C. W. Boyd, were invited to see a case of fungus hæmatodes in an aged draft horse in a young veterinarian's infirmary. The tumor was situated in the back part of the orbital cavity, and pushed the eye almost beyond and through the eyelids. A young medical doctor extirpated the eyeball very dexterously, but he and the young veterinarian hesitated about attempting removal of the main body of the tumor which was the real source of the trouble; but I urged the importance and necessity of a complete operation. The doctor then cut into the tumor, and the hemorrhage was alarming and extensive, and they feared it would be impossible to arrest the hemorrhage if the operation was finished. The orbital cavity was firmly plugged with absorbent cotton saturated in Monsel's solution, and the eyelids were securely sutured. The hemorrhage continued and caused rupture of the connective tissue under the skin for considerable space around the orbit. Bandages were firmly applied and secured to limit the hemorrhage. The patient was returned home in a few days. I was called to see this patient eight days afterwards, and was greatly surprised at finding the bandages intact and exactly the same as I had seen them applied at the operation. A slough about the size of an ordinary table-plate came away on removal of the bandages. The wound was rapidly dressed with carbolized lotion, and the owner was recommended to consult the attending veterinarian about final disposal of the subject. The extensive and long-continued pressure evidently destroyed nearly all of the malignant growth, and the treatment was continued, and the animal improved and almost recovered in about three months; but, unfortunately, it suffered from an attack of paralysis and succumbed to the disease.

Dr. N. Rectenwald has a very interesting case under treatment, which we will report at an early date.

OPEN JOINTS.*

BY DR. J. C. MICHENER.

This subject is chosen for the purpose of giving a special treatment. The anatomical structure and the various injuries and operations by which synovial capsules are opened, or become so, by

* Read before Annual Meeting of the Pennsylvania State Veterinary Medical Association, March 8th, 1893.

the suppurative process, will be alluded to only as deemed necessary to illustrate the principle of treatment.

In the management of the larger animals we encounter a great difficulty, in as much as we cannot enforce that repose which the human surgeon finds so necessary in the treatment of open joints.

Our cases, if left to the unaided powers of nature, result in ankylosis or a suppurative arthritis and the destruction of the patient's life. These results, coupled with the intense suffering, make it a matter of great import to devise means by which a prompt and complete cure may be effected.

The first indication is to close the wound to prevent the escape of synovia and the ingress of deleterious germs ; secondly, to combat the tendency to inflammation, more or less severe from the amount of laceration, contusion and lapse of time that the joint has lain open.

The chief obstacle to permanently closing an open joint is the very slow process of repair in ligamentous coverings. Ligament is devoid of sensibility and a complete circulation, giving low vitality.

The breach of continuity is first closed by the product of osmosis, being organized into a thin, fibrous film, requiring several weeks to harden and thicken into true ligament. In the usual course it proves too delicate to withstand the tension of the increased synovial secretion, and the difficulty is further increased by a constant tendency to suppuration.

Now, without decrying the usefulness of the usual remedies, such as the application of styptic colloid, shellac or collodion, to exclude the air and irrigation, to keep down inflammation, we have a very much superior treatment to offer. One that better fills the indications and proves highly satisfactory in practice.

Simply the application of good antiseptic blisters, supplemented by such surgical aids as the nature of injury requires.

The most common accident to joints met in the country is puncture by frost nail, calk of shoe or tine of fork ; such injuries at first appearing very trivial to the inexperienced, requiring from three to ten days to slough a free opening and establish active synovitis, consequently valuable time is lost and a very easily managed affair becomes one of serious import.

In all such cases, when seen before much discharge occurs or lameness supervenes, should have all inverted hairs, shreds of skin or dirt carefully removed, and the hair clipped over a space the size of a silver dollar, or over the entire joint in severe cases.

Now, the blister ointment is liberally applied and well rubbed in, filling up the wound and coating it over. This should be watched for two days and reapplied as it melts from the opening or fails to act over the clipped surface. Keep up the counter-irritation for three days and your patient is safe and ready to go to work as soon as the effect of the blister subsides.

If the case has been neglected until there is great inflammation, pain and lameness, and the synovia is sent out in jets at each movement, but has not yet become bloody, we proceed as before, preparing for an external blister over the entire joint, and in addition provide ourselves with a portion of melted ointment, a syringe with nozzle that nicely fills the opening, a plug of fine cotton, pieces of muslin, thickly coated with the ointment to envelop the joint, and bandages.

After twitching the patient and using an injection of cocaine, proceed to inject the joint full as possible with the melted blister and plug quickly and retain with a suture if necessary. Apply the external dressings and allow them to remain twelve hours when they are removed, the plug taken out, and a rag, covered thickly with the ointment, placed over the wound and remainder of the joint, if the first application has failed to act thoroughly.

In twenty-four hours the suffering patient that stood on three legs, with the lame one in almost constant motion, will have its weight upon the injured limb, resting the opposite, breathing easily and taking his feed.

In rare severe cases the pain may recur in a few days and the wound point and reopen, when the same treatment is repeated. If by any mishap the case has become chronic, repeated blisters and irrigation during the intervals is the best I have found.

Where we have extensive laceration, ligament torn through, tendon off and fracture of bone, I have plastered the wound until closed as a mason would a crack in a wall, brought the parts together with sutures, and kept the wound and whole injured part covered with blister with the most happy results.

In short, whenever any of the hard tissues of the limbs, joints or feet are wounded, my practice is to get blister ointment in and around the part quickly as possible. It draws more blood to the part, causes the opening to swell shut, acts as a bandage, lessens motion, and the process of repair goes on rapidly, while the counter-irritation preserves the internal parts from a destructive inflammation, ending in suppuration, exostosis and ankylosis.

This treatment is not new with our family and I apply it with

the greatest confidence in all cases, except where the discharge has become ichorous and bloody, indicating exfoliation of the ends of the bones, which, if in an important joint, renders the case hopeless.

The blister must be antiseptic. Simply cantharides rubbed into stale lard will not answer. The body of the ointment must consist of beeswax, rosin and lard in proportions to suit the season, to every pound of which should be added four ounces of spirits of turpentine in which sulphuric acid has been slowly stirred until effervescence has taken place, cantharides four ounces.

The patient should be early in the slings and may have such internal remedies as his condition indicates.

ACTINOMYCOSIS BOVIS, OR "LUMP JAW."*

BY R. R. DINWIDDIE, V. S.

This disease of cattle is one quite often observed in all countries where cattle are raised. While it occurs principally in cattle, cases of this disease have been reported in man, horses, dogs and pigs; but the occurrence of this disease in other animals than cattle is very rare.

This disease is commonly called "lump jaw," "big jaw," "big head," or "swelled head," and the lumps or tumors produced are known as "wens," "clyers," "cancers," "bone cancers," etc. When the tongue is the seat of the disease, this organ becomes hard and tense, and its usefulness is much impaired. This condition is commonly known as "wooden tongue."

This disease has been described by veterinarians and others as a cancer or tumor, under the following names, "fibroma," "myoma" and "osteosarcoma," until within the past fifteen years; since the true nature of the disease has been recognized, it has been described as *Actinomycosis bovis*.

This disease has attracted comparatively little attention until recently, and then principally on account of the peculiar pathological changes produced. The loss from the disease was very small. Animals were treated in the early stages of the disease and recovered, or they were sent to the shambles before they became seriously affected. Within the past five years, however, live-stock

* Electrotypes kindly loaned by N. S. Mayo, D. V. S., Medical Society Experiment Station, Kansas State Agricultural College.

sanitary commissions in some States have condemned animals affected with this disease, as suffering from a "dangerously contagious disease," and the flesh as "dangerous as food," and at the present time between two and three thousand cattle, annually, affected with this disease, are condemned and slaughtered at Chicago, St. Louis and other market places. The loss to stockmen, and the litigation resulting therefrom, have served to bring this disease prominently before the public.

PREVALENCE OF THE DISEASE.

It is difficult to form a correct estimate of the prevalence of this disease, as it is quite generally distributed throughout the country.

In 1889, at the Union Stock Yards, Chicago, there were condemned and slaughtered 830 cattle affected with actinomycosis out of a total received of 3,023,281. This gives about one case of actinomycosis to every 3,642 cattle. In 1890 1,751 cases of actinomycosis were condemned out of a total of 3,484,280 cattle, which gives one case of actinomycosis to 1,990 cattle. In 1891, during 10 months, from January to November, 1,655 cases were condemned, and in 12 months, from November 1, 1891, to November 1, 1892, 1,888 cases were condemned. As I have not the total receipts of cattle at the yards for that time, I cannot form an estimate of the proportion. It will probably be in the neighborhood of one case of actinomycosis in every 1,600 or 1,700 cattle.

The great discrepancy in the number of cattle condemned in the years 1889 and 1890 must not be attributed to the rapid increase of the disease, but rather to the vigilance of the inspectors. Still, any estimate based upon the proportionate number of cases found in the Union Stock Yards will probably be much too low, as many stockmen do not ship the cattle affected with this disease, but dispose of them to local butchers. From my own observations I am of the opinion that one case of actinomycosis to 500 cattle will be a more correct estimate.

Observations *seem* to show that animals pastured upon low lands are more liable to contract this disease, also cattle fed upon rough feed, but this may be due to the greater danger of wounding the mucous membrane of the mouth, and thus affording a favorable opportunity for the organism to invade the tissues and cause the disease.

SYMPTOMS OF THE DISEASE.

This disease is characterized by a lump or tumor, situated, usually, in the region of the head or throat. This tumor is caused

by peculiar vegetable parasites which grow in the animal tissues; from their peculiar radiating, or star-shaped structure, they are called "actinomyces."

The first symptom of this disease is a slight swelling of the affected part, such as might result from an injury; in fact, many cases of actinomycosis appear to be caused by blows or injuries received by struggling in stanchions. The actinomyces must be present, however, in order that an animal may contract the disease. The enlargement gradually increases in size, and is usually well defined from the surrounding tissues. Upon manipulation, the tumor feels hard and dense, and, if not caused by the bulging of the adjacent bone, is usually attached to it. In the region of the throat it may be fluctuating. After a variable length of time the tumor softens in one or more places and discharges a rather thick, yellow and very sticky pus or matter. This discharge of pus may continue until the animal dies, or is disposed of. Usually, however, the opening heals temporarily, only to go through the same process again. Often these tumors break and discharge the pus into the cavity of the mouth or throat. Sometimes, when a tumor breaks, a growth of new tissue protrudes from the opening, grows rapidly and resembles a cauliflower somewhat in appearance. Unlike an ordinary abscess, an actinomycotic tumor, after discharging pus, increases in size rapidly, until the tumor may reach the dimensions of a peck measure, or larger. In the later stages the teeth may become ulcerated and loosened and there is a drivelling of saliva from the mouth.

AGE AT WHICH THE DISEASE OCCURS.

There seems to be no age when cattle are not subject to this disease, though I have never observed a case in a sucking calf. Most cases observed have been in two and three-year-old cattle. This may be accounted for partially by the fact that most cattle are "turned off" at this age, but as they are shedding their temporary molars, the irritated condition of jaws may offer favorable conditions for the reception and growth of the organisms which cause this disease.

There seems to be no especial time of the year when animals are more liable to contract this disease than another.

LOCATION OF THE TUMOR

Of the location of the tumor I have found it to occur most frequently upon the lower jaw, next the upper jaw or face, throat and tongue, in the order named. Cases are reported where the

disease has occurred in the lungs, liver, along the alimentary canal and in other parts of the body.

Plate I shows a case of actinomycosis of the lower jaw, one of the most common locations. In this case the tumor is caused by the bulging of the jaw-bone. The pus from this tumor was discharged into the mouth. The scars on the tumors show where in-

PLATE I.



Actinomycosis bovis, or lump jaw.

cisions were made to obtain material for inoculation and examination.

Plate II shows another common form, where the tumor is situated upon or within the bones of the face. This tumor discharged a little pus through the openings visible on the tumor, and

which were made to obtain material. Most of the pus was discharged into the mouth.

COURSE OF THE DISEASE.

This disease is not rapidly fatal, and animals seldom die from the direct effects of the disease. The length of time an animal

PLATE II.



Actinomyces bovis, or lump jaw.

may survive with this disease depends largely upon the location of the tumor and the rapidity of development. If the tumor is favorably situated, so it does not interfere seriously with the prehension or mastication of food, the animal usually survives several years. When death results from this disease, it is usually due to inanition

the animal, being unable to gather or masticate its food properly, together with the drain upon the system by the discharge of pus, becomes emaciated and gradually dies of starvation. Several cases observed have suffered from this disease for five or six years, and would probably have survived several years more had they not been disposed of. Most cases of this disease are not allowed to run their course, the animals being treated in the early stages, or disposed of to local butchers or are destroyed.

MORBID ANATOMY.

The lump or enlargement is the result, largely, of the multiplication of cells, principally of epitheloid and spindle-shaped connective-tissue cells. In this respect it differs from an ordinary abscess, where the enlargement is the result of an accumulation of pus. As the growth of these cells in an actinomycotic tumor increases, they press against the surrounding tissues, producing the hard and dense condition of these tumors. On section through the tumor one of the first things noticed is the peculiar and rather disagreeable "nutty" odor which, I believe, is characteristic of this disease. The outside of the tumor is a dense mass of fibrous connective tissue. Toward the center of the tumor the tissue is less dense and more vascular, being composed principally of epitheloid cells. In this tissue there are small, more or less globular, cavities containing a quantity of viscid pus. If this pus is spread out thinly upon a knife blade or bit of glass, and examined carefully, small yellow specks, barely visible to the unaided eye, will be noticed. These little specks are portions of the actinomyces, which cause the disease. Sometimes the pockets of pus are so filled with these minute organisms that they present a crumbling appearance. Usually these pus cavities are connected with each other by small sinuses, though not always. These small pockets may be separated from each other by bands of fibrous tissue which are distributed through the substance of the tumor.

If the tumor is caused by a bulging of the bones of the head, as is the case whenever the organism gains entrance and commences growing in the interior of the bone, the bone tissue in the interior becomes disintegrated and absorbed in places, and pockets are formed containing nests of actinomyces, as in muscular tissue. While the interior of the bone is being broken down by the action of this disease, the diameter of the bone is increased by the deposition of new material, until it may be several times its

normal size, and the interior be completely honeycombed as a result of this disease.

This bulging and honeycombed condition of the bones is illustrated in plate III. Figure 1 is the jaw of the animal shown in plate I. The surrounding tissue has been removed to show the increased size of the jaw bone. The darker spots on either side of the molar teeth are openings through which pus was discharged into the mouth. These openings are nearly filled with a growth of neoplastic tissue from the interior of the tumor. Figure 2, same

PLATE III.

Jaw-bone, showing effects of actinomyces.



FIG. 1.

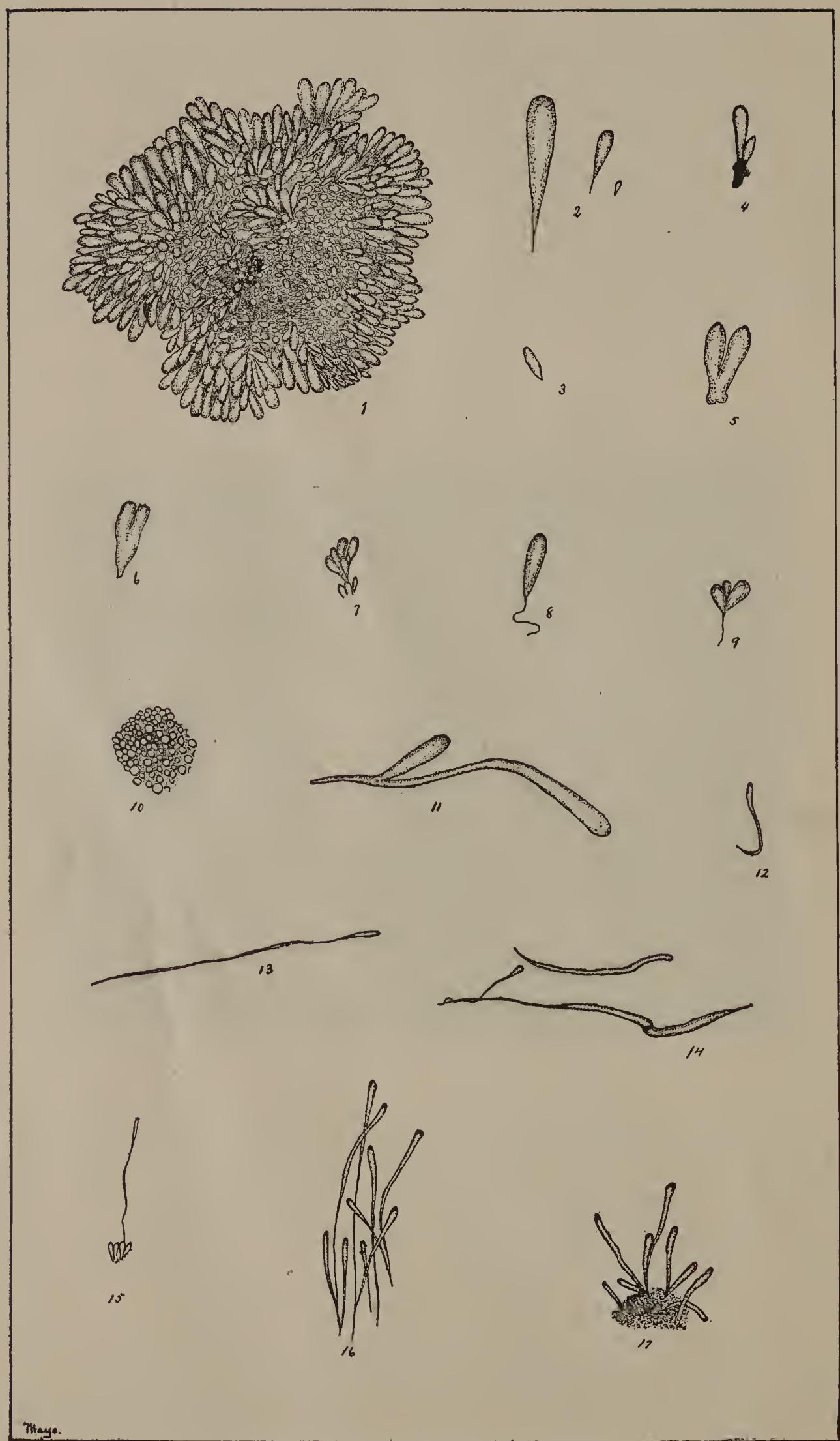
FIG. 2.

plate, was intended to show the honeycombed condition of the bone, but is not very satisfactory, it being difficult to show by means of a photograph.

The tumor shown in figure 1 was about eight months' development; figure 2 about five years.

HISTOLOGICAL EXAMINATION OF TUMOR.

Examined microscopically, the muscular tissue in the immediate vicinity of the tumor seems to be undergoing a gradual disintegration. Many of the fibres are much smaller in diameter than normal, the



Actinomyces, magnified 500 diameters.

striæ are less distinct, and the fibres are paler than usual. Occasionally muscular fibres are found which are enlarged several times their normal diameter and filled with a granular protoplasm.* In these fibres in some cases I have found what appears to be the mycelium of the actinomyces running lengthwise through the fibre, and at some point in the muscular fibre there seems to be a rosette forming. Between the muscular fibres, and throughout the substance of the tumor large numbers of cell nuclei are found, which stain deeply. In bone tissue that is slightly affected, large numbers of osteophytes are found, but in case the bone is very badly diseased the bone cells seem to be few or wanting entirely.

CAUSE OF THE DISEASE.

This disease is due to the growth in the animal tissues of a peculiar vegetable organism, named from the radiating or star-shaped structure "actinomyces." The rosette or radiating portions of this fungus are very numerous in the pus from an actinomycotic tumor, and appear to the unaided eye as minute specks. These little specks are collections (rarely single) of rosettes. A single rosette is shown in figure 1, plate IV, as it appears when flattened slightly and examined under a compound microscope. The rosettes vary much in size, not only in different animals, but in the same animal, ranging from 10mm to 200mm, 30 to 40mm being the prevailing size. The largest rosettes observed were probably not single, though it was difficult to determine, as they seemed to coalesce.

The rosettes are composed of a number of club-shaped structures which radiate from the centre of the mass. These club-shaped bodies vary as much in size as do the rosettes. Figure 2, plate IV, shows this variation in size. From 1 to 10mm are common measurements, though occasionally some are found which exceed these. Figures 3, 4, 5, 6 and 7 show different shaped clubs that occur. The club-shaped bodies do not reach to the centre of the rosette, but are connected with it by a fine thread-like structure, which is shown in figures 8 and 9. This thread-like structure is not readily demonstrated, for, in tearing out or crushing the rosette, the clubs break off at their junction with this thread. Some investigators have mentioned a polymorphous form of actinomyces in which coccoid and rod-shaped structures are found. The only

* Dr. Heneage Gibbes considers these granules of protoplasm as rays of the actinomyces, but to me this granular mass seems to be altered protoplasm of the muscular fibres, caused by the growth of the mycelium. I have been unable to demonstrate a connection between the mycelium and the granules of protoplasm.

coccoid appearance which I have observed is in focusing on a rosette, the ends of the clubs first appear, as shown in figure 10; but that these coccoid bodies are ends of clubs seems too evident to mislead. This polymorphous form will be discussed somewhat under the head of "Culture Experiments."

Figure 11 shows what may be called a monstrosity, and one of such size and shape is rarely met with. I am unable to determine whether it is an exaggerated club-shaped portion or a portion of the mycelium; probably it belongs with the club-shaped portions.

If a piece of neoplastic tissue which forms in an actinomycotic

PLATE V.

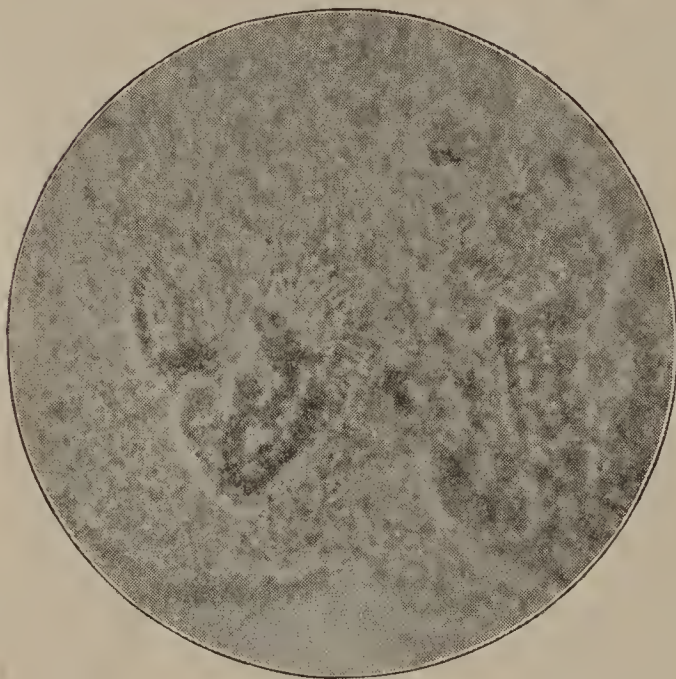


PLATE VI.

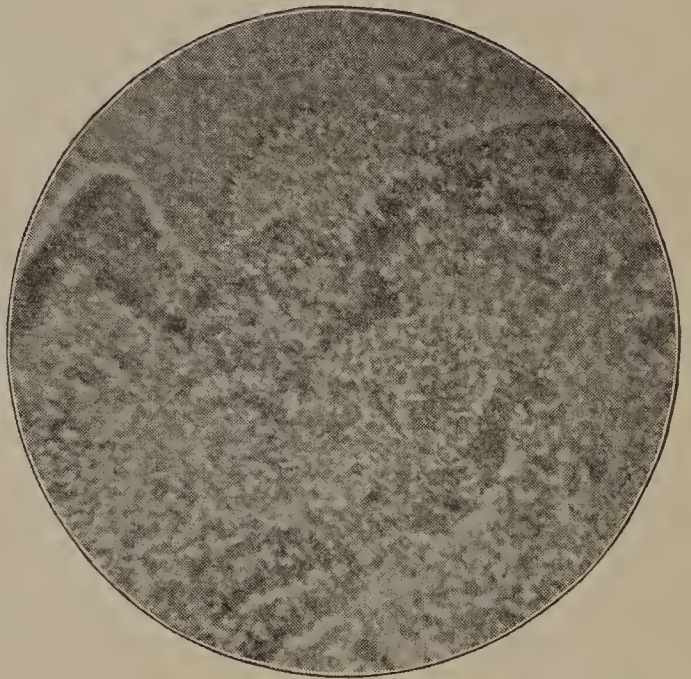


Photo-micrographs of actinomyces in tissues.

tumor, and which usually contains the actinomyces in an active, growing stage, is allowed to decompose in a wet chamber, and the detritus carefully washed away with distilled water, structures such as are shown in Nos. 12, 13, 14, 15, 16 and 17 may be found. It will be noticed that these portions of the organism are much longer and not as thick as the clubs which form the rosettes. These slender threads are the mycelia, or growing portions of the organism which penetrate new tissue and thus extend the sease.

The mycelial threads, shown in figures 13, 14 and 15, are wider in some portions than in others. In the narrowest places the walls seem to touch each other. Whether this irregularity is natural or the result of twisting the mycelial thread I am unable to determine. I have not been able to demonstrate partitions in the mycelium, the apparent partition in figure 14 being a twist of the mycelium. This widening and narrowing of

the mycelium is so constant as to lead one to the opinion that the mycelial thread is greater in one diameter than the other, and the irregular outline may be due to twisting.

In figures 15 and 16 the mycelia were pushing out from a rosette. The mycelia are much more difficult to stain than the clubs of the rosettes. In figures 16 and 17 the mycelia seem to branch, but a careful manipulation of the specimens did not demonstrate this, and I have failed to find specimens that were certainly branched.

The mycelia are rarely found in rosettes, as they occur in the pus from the tumor. The rosettes in the pus are larger, the club-shaped bodies are much thicker, and stain more readily than the rosettes found growing in the tissues.

MANNER OF GROWTH IN TISSUES.

It is extremely difficult to trace the growth of the actinomyces through the tissues. The mycelia are so small, and as they do not run any distance in the same plane, it is impossible to get more than a very small portion in the focus of a lens of a sufficient power to show the mycelium. I have found it impossible to stain the mycelia, but by staining the surrounding tissues, the mycelia, on account of the difference in the refraction of light, appear as very bright threads. For staining sections, I have had the best results from a double stain, picro-carmin and Spiller's purple, recommended by Doctor Gibbes. Muscular tissue I have found the best for demonstrating the mycelia, as there seems to be a tendency of the mycelium to follow the course of a muscular fibre, but even here it is impossible to follow it but a little distance. The mycelium is more readily seen close to the free extremity on account of its greater size. Neoplastic tissue ranks next to muscular tissue in ease of demonstrating the mycelia. They can be found in other affected tissues, but not as readily, except in white fibrous connective tissue, where I have been unable to demonstrate the mycelium to a certainty. While the mycelial threads are undoubtedly present, the highest refractive power of the fibrous connective tissue makes the demonstration of the mycelia extremely difficult, if not impossible. The mycelial threads can be demonstrated in almost all the affected tissues, but I have been unable to find them in adjacent tissues that were apparently healthy.

At varying distances along the mycelia rosettes are formed, and can be readily seen in sections. Occasionally they appear as single rosettes, as in plate V, but the most common form is a

cluster of rosettes which coalesce and form a nest, as is shown in plate VI. The photo-micrographs, from which these cuts were made, were taken with a Zeiss 2.5mm. objective from sections of neoplastic tissue, and are magnified 400 diameters. I found it impossible to make satisfactory drawings, and the photo-micrographs only show the general structure, as it is impossible to get the organism in a single focal plane.

CULTURE EXPERIMENTS.

Attempts were made to grow the actinomyces in various culture media outside the animal economy, in order to study the various stages in the life history of the organism, and to furnish, if possible, material for inoculation. Over 300 trials were made under the following conditions: 120 were made upon agar agar, plain and nutrient, 58 upon nutrient gelatine, 60 upon blood serum, 40 in bouillon, and others upon sterilized egg and potato. They were tried at the temperature of the room, and in an incubator at a temperature of 100 degrees F. Surface and anærobic cultures in gelatine and agar agar, and surface cultures on blood serum in an atmosphere of hydrogen were tried, but all were unsuccessful, and in no case was I able to get a marked growth of actinomyces.

The greatest difficulty encountered was to obtain the actinomyces free from bacteria, and as soon as the actinomyces were placed in culture media the bacteria developed very rapidly. In spite of precautions taken in collecting and thorough washing with distilled water, less than 10 per cent. were free from bacteria. The bacteria occurring in cultures were those commonly found in pus; staphylococcus pyogenes albus and aureus, together with micrococci and bacilli. Inoculation with pure cultures of the bacteria produced no serious results. It sometimes occurred that, in a flask inoculated with actinomyces, the micrococci would develop rapidly, and, in the course of ten days, would be superseded by bacilli. To a superficial observer it might appear that the actinomyces changed into micrococci and then into bacilli, and these circumstances may have given rise to the "polymorphous" form of actinomyces, mentioned by some investigators. In these cultures I have always found the actinomyces in their original form, and cultivation of the bacteria through successive generations invariably gave pure cultures of the original micrococcus or bacillus. This is the nearest to a "polymorphous form" of the actinomyces that I have observed.

In studying the action of actinomyces upon an artificial media I found that when kept upon agar agar for nearly four months they made no growth that was apparent on a careful examination, though the organism appeared as fresh as when first put in. In some cases the clubs appeared slightly swollen, but careful measurements and comparison with fresh specimens gave no positive results. Tufts or rosettes of actinomyces were measured and their general appearance noted as closely as could be, and then placed in culture tubes or flasks, and after variable periods compared with the original measurements, but no positive indications of growth were noted. In a few cases mycelial threads seemed to have pushed out a short distance from rosettes that were obtained from fresh neoplastic tissue, but in any case they were no longer than those found in rosettes taken directly from the tissue. Short mycelial threads can be found proceeding from rosettes taken from tissue where the actinomyces are growing rapidly, but are rarely found in rosettes as they occur in pus discharged from a tumor.

The actinomyces show great resistance to decomposition. If a piece of tissue containing the organisms is allowed to decompose in a wet chamber, the actinomyces retain their original appearance. If pus containing the rosettes is allowed to dry upon glass, by soaking in water a short time they regain their original appearance. I have kept material in this manner for two years in the laboratory, and after soaking a short time the rosettes look as fresh as when first obtained. The actinomyces also show great resistance to stains. Gram's method, Bismarck brown and gentian violet, gives fair results. Spiller's purple has given the best results. The actinomyces can be studied very nicely without staining, by using a high power and changing the light. Specimens can be preserved nicely by mounting in glycerine.

INOCULATION EXPERIMENTS.

An attempt was made to inoculate animals and produce the disease by using the pus which escaped from a tumor, and which contained large numbers of the rosettes. In the inoculations made the pus was examined microscopically, to be certain that it contained the organisms.

The animals used were guinea pigs, one dog, two two-year-old steers, and two heifers—one three-year-old, which was inoculated only once (No. 3), and one yearling heifer, a small Jersey.

All the material used for inoculation was taken directly from a

tumor and transferred to point of inoculation, except in Nos. 1 and 2. This pus had been kept nearly forty-eight hours, and was somewhat decomposed. In Nos. 3, 4, 5 and 6, the pus was kept about twenty-four hours.

INOCULATIONS.

No.	Kind of Animal.	Region.	Material used.	Results.
1..	Guinea-pig.....	Shoulder.....	Pus.....	(Edœma; pig sick for two days; healed.
2..	"	Hip	"	{ Edœma; pig sick for three days; died of septæmia.
3..	Heifer, 3 years old....	Neck	"	{ Abscess formed and discharged; healed in 10 days.
4..	Dog.....	Shoulder.....	"	Healed.
5..	Guinea-pig.....	Neck.....	"	"
6..	"	Shoulder.....	"	"
7..	Steer, 2 years old.....	"	"	"
8..	"	"	"	"
9..	"	Neck.....	"	"
10..	"	Side of jaw.....	"	"
11..	"	Shoulder.....	"	"
12..	"	"	"	"
13..	Guinea-pig.....	Hip.....	"	"
14..	"	Shoulder.....	Neoplasm	{ Healed for 10 days, then grew and formed tumor.
15..	"	"	"	{ Gave signs of growing, but finally healed.
16..	Heifer, 1 year old.....	"	Pus.. ..	Healed.
17..	"	Neck.....	Neoplasm.....	Grew.
18..	Steer.....	Back.....	"	Gave promise of growing, but did not.
19..	Heifer.....	Shoulder.....	Pus.....	{ An abscess was formed artificially and inoculated; healed.
20..	Steer.....	Neck.....	Neoplasm.....	Healed.
21..	"	Shoulder.....	"	Grew.
22..	Guinea-pig.....	Hip.....	Pus.....	Healed.
23..	Steer.....	Tongue	"	"
24..	"	Shoulder.....	"	"
25..	"	Side of jaw.....	"	"
26..	Heifer.....	Shoulder.....	Neoplasm.....	Grew.
27..	"	Neck.....	"	"
28..	"	Jaw	"	{ Gave signs of growing, but finally healed.
29..	"	Thigh	Pus.....	Healed.
30..	Steer.....	Neck.....	"	{ About one ounce of pus was used; an abscess formed, discharged and healed.
31..	Guinea-pig.....	Back	"	Healed.
32..	Heifer.....	Shoulder.....	Neoplasm.....	Grew.
33..	Steer.....	"	"	Healed.
34..	"	Jaw.....	Pus	"
35..	Heifer.....	Parotid gland...	"	{ Considerable Edœma; hard bunch formed, but disappeared in three weeks.
36..	"	Jaw.....	Neoplasm....	Grew.
37..	Steer.....	Back	Pus.. ..	Healed.
38..	"	"	"	"
39..	"	Flank	"	"
40..	"	Shoulder.....	"	{ Abscess formed artificially and in- oculated; healed.
41..	Guinea-pig.....	Hip.....	"	Healed.
42..	"	"	Neoplasm.....	Pig died of septæmia.
43..	Steer	Neck	Pus.. ..	Healed.
44..	"	Jaw.....	"	"
45..	Heifer.....	Submaxillary...	"	"
46..	"	Inside of thigh.	"	"
47..	Steer.....	Flank.....	"	"
48..	"	Submaxillary...	"	"
49..	"	Shoulder.....	Neoplasm.....	Grew.
50..	"	Tongue.....	Pus.....	Healed.
51..	"	Jaw.....	"	"

In the 51 inoculations, 37 were made with pus from an actinomycotic tumor which contained rosettes, and none grew to form an actinomycotic tumor. In Nos. 3 and 29 an abscess formed, which, on breaking, discharged pus which contained the rosettes but only those that were placed there with the pus; none grew in the tissues. In Nos. 15 and 34, which gave evidence of growing, a bunch formed such as precedes an abscess, but was finally absorbed. In all four cases a very large quantity of pus was used in inoculation. In Nos. 19 and 39 an abscess was first formed artificially, and pus containing rosettes placed in the cavity of the abscess; both failed. Of the 14 inoculations made with neoplastic tissue, which contain the actinomyces in a growing stage, eight were successful, and a characteristic actinomycotic tumor resulted. Five failed to grow and, in one case, septæmia followed, which destroyed the animal.

In those cases where the disease was produced, the term "transplanting" will express the conditions more clearly, because tissue which contained the growing organism was transferred to another animal, or another part of the same animal, and thus produced the disease.

In all cases where the inoculations were successful, the wound healed rapidly and only a small fibrous bunch remained. In the course of from 14 to 27 days this began to enlarge, and assumed the characteristic appearance of this disease.

One case of accidental infection occurred in the animals under observation. In the animal illustrated in Plate II, the tumor discharged pus into the mouth through three openings which were nearly filled with neoplastic tissue which protruded into the mouth cavity. This steer contracted the disease in the left lower jaw, between the third and fourth molars. This was not observed until an autopsy was held. Whether infection occurred from pus or from infected feed or from a piece of neoplastic tissue, I cannot say to a certainty. From the results obtained from inoculation, the infection was probably produced by a piece of detached neoplasm. The autopsy also revealed an abscess of the rumen, which was caused by wire nails which the animal had swallowed, penetrating the walls of the rumen. The abscess contained about six ounces of laudable pus, but no actinomyces were present.

Some writers have assumed that the small fibrous tumors, situated along the small intestines and filled with a cheesy pus, which have been observed in some animals, were actinomycotic in nature. These small fibrous tumors are quite as common in cattle not

affected with actinomycosis, and the tumors themselves are not actinomycotic in nature.

NATURE OF THE ACTINOMYCES.

As actinomyces, in their growth in the animal tissues, form mycelial threads with rosettes of club-shaped bodies, they may be classified as a degenerate form of some species of the Ascomycetes, a group of plants which include many of our common fungi. It is generally conceded that the animal tissue is not the natural *habitat* of the actinomyces. They probably grow, naturally, upon other plants, especially upon the *graminæ*, and mature their spores. These spores, when taken into the animal economy with the food, may gain entrance to the tissues through a wound, vegetate, and produce the disease known as actinomycosis. It is probable that the conditions for growth of the organism in the animal tissues are not sufficiently favorable to allow the plant to mature spores; hence the club-shaped bodies are not capable of vegetating.

I have examined many common grasses and grains for actinomyces, but have been unable to find them, though some investigators report success in this direction. I am of the opinion that the actinomyces are so changed in the animal tissue by the different surroundings and conditions for growth, as to be unrecognized. I have tried injecting spores of a number of our common fungi into the animal tissues, in hopes of possibly stumbling upon the fungus that produced the actinomyces, but without success.

HOW ANIMALS CONTRACT THE DISEASE.

There is a theory that one animal will contract this disease from another by eating food upon which has fallen the pus from an actinomycotic tumor; but experiments show that the disease cannot be transmitted by the rosettes which are found in the pus. Cases can be cited where several animals have contracted the disease in succession as going to prove that one animal contracted the disease from another. In such cases the animal must have contracted the disease from the same source, infected food. On the other hand, cases can be cited where an animal suffering from this disease has mingled freely with many others for a number of years, and no other cases of the disease occurred. Cases also occur upon farms where the disease has never been known before.

The probable mode of infection is by animals eating food upon which the organism which produces the actinomyces is growing; a spore, or possibly a piece of the growing organism, gains en-

trance into the animal tissues, either through an abrasion of the tissues or opening of a gland, vegetates, and produces the disease known as actinomycosis. In some cases animals undoubtedly contract the disease by inhaling the spores, which may lodge in the sinuses of the head and produce the disease in this region. Animals may become affected with this disease in any region to which the spores of the original fungus may gain access from the outside of the body or through the digestive or respiratory systems, but not through the circulatory system. I have tried to produce this disease by giving animals food mixed with pus from an actinomycotic tumor, but was not successful.

TREATMENT.

If the tumor is favorably situated, and is treated early and thoroughly, a complete cure may be expected; but if the disease originates within the bones, it usually secures a good foothold before treatment is begun, and in many cases treatment is very unsatisfactory.

There are two general methods of treatment: First, by removing the tumor; second, the iodide of potash treatment. The best and most satisfactory treatment, where it can be applied, is complete removal of the tumor, either with the knife or by using caustic medicines. Of these, the knife is preferable for small tumors. The whole tumor should be removed and the wound treated with some good antiseptic solution, such as corrosive sublimate one part, to 1,000 parts of water. If care is exercised to remove all the diseased tissue, a complete cure may be expected.

Another method of removing the diseased tissue is by the use of caustics. Arsenic or corrosive sublimate is commonly used, a small quantity being wrapped in tissue paper and pushed into the center of the tumor; sometimes, if the tumor is a large one, several pellets of the caustic are pushed into the different parts of the tumor. In the course of from 12 to 15 days the diseased tissue surrounding the caustic sloughs out and the wound is then treated with an antiseptic solution as before. It is often quite difficult to remove all the diseased tissue by the use of caustics, and the tumor may continue to grow. In using caustics it must be remembered that these caustics are irritant poisons, and should not be left on the surface of the tumor, if it is situated so an animal can lick the affected part.

The iodide of potash treatment consists in giving the iodide of potash internally, in from one to three drachm doses, according

to the size and age of the animal. The iodide of potash should be dissolved in a pint of water and given as a drench. In the course of a week a condition known as iodism will be produced, there will be a slight discharge from the eyes and nostrils and the epidermis scales off, especially in the region of the neck. The use of the iodide of potash seems to destroy the actinomyces, and the tumor may be absorbed. It is necessary to continue the medicine for two or three months, and the treatment requires much time and is expensive. This treatment has not given good results in my hands. For the first two months the tumor is usually absorbed quite rapidly, but it usually reaches a stage where further treatment is useless. I have found the hypodermic injection of a weak solution of iodine (.05 per cent.) in the affected tissues aids materially in the absorption of the tumor.

IS THE FLESH DANGEROUS AS FOOD?

As this disease is purely local in character, and does not extend beyond the tissues visibly diseased, there is no danger of contracting the disease from eating the flesh of affected animals, provided the diseased portions are removed. While a few cases of actinomycosis in man have been reported in this country (less than a dozen), there is no evidence whatever that they contracted the disease from the flesh of affected animals. When this disease occurs in man it must be considered as originating from the same source as in cattle—that is, from infected grasses or grains. I do not wish to be considered as advocating that all animals suffering from this disease should be slaughtered for food. Whether the flesh of actinomycotic animals is a *proper* article of food must depend upon circumstances. If the animals are in good condition and the tumor is small, I should consider the flesh of such an animal as suitable for food; but if the animal is thin, or the tumor large or discharging pus freely, they should be condemned, not because the flesh is dangerous as food, but because it is not a proper or suitable food. To illustrate: If an apple, otherwise perfect, contains a small decayed spot, if the decayed portion is removed I should consider the remainder suitable for food. If the apple is small and the decayed portion extensive, it should be rejected, not because it is dangerous, but because it is not suitable for food.

CONCLUSIONS.

Actinomycosis bovis, or lump jaw of cattle, is a parasitic disease caused by the growth in the tissues of a fungus called actinomyces.

It appears as a lump or tumor usually in the region of the head or neck, and may grow to a large size. This tumor usually discharges a yellowish pus, which contains portions of fungus known as actinomyces. It is not transmissible from one animal to another by means of the actinomyces as they are found in the pus. It can be transmitted to other cattle by inoculating with a piece of tissue from the tumor which contains the organism in a growing state. The actinomyces, which cause this disease, are probably a degenerate form of some fungus which grows naturally upon feed stuffs or grain. When the spores of the original fungus are taken into the animal economy, they may gain entrance to the tissues, vegetate, and produce the disease known as *Actinomyces bovis*, or lump jaw. There is no danger of persons contracting this disease from eating the flesh of affected animals, provided the visibly diseased portion is removed.

The treatment consists in removing the tumor, either with a knife or by the use of caustics. The iodide of potash given internally may effect a cure.

CORRECTION.

Journal of Comparative Medicine and Veterinary Archives :

On page 105 of your February, 1893, issue the word *unfair* should be *unfortunate*. It occurs on the 10th line from the foot of the page.

On the 12th line from the foot of page 71 *perforatus* should be *perforans*.

Yours respectfully,

W. BRYDEN.

26 SUDBURY ST., BOSTON.

EDITORIAL.

PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION.

The Pennsylvania State Veterinary Medical Association held its annual meeting in Philadelphia on March 7th and 8th. Our readers will find in this number of the JOURNAL several of the valuable papers which were read at this meeting, and in the next number will have a full account of the proceedings for which we could not longer hold the publication of the March issue. This meeting was preëminently one of the best veterinary conventions ever held in the country. It was held in the rooms of the College of Physicians, which accords the veterinarian his proper recognition as a medical confrere.

The sessions were largely attended by a half-hundred members from all over the State, and by visitors from other States. The discussions were entered into by sanitarians and prominent members of the Board of Health and by eminent medical men. The question of milk supply and the relation of the veterinarian to the question of public health formed important portions of the reports and discussions.

The President, Dr. W. H. Hoskins, deserves the greatest credit for the training of the Pennsylvania Association and the great success which it has achieved, and is to be congratulated by the members of the United States Veterinary Medical Association who have already recognized his valuable work in his position as their Secretary.

SOCIETY PROCEEDINGS.

Keystone Veterinary Medical Association.—The regular meeting was held February 14th at the College of Physicians, President Dr. R. G. Webster in the chair. Drs. Hoskins, Kooker, Lintz, Webster, Lusson and John R. Hart answered roll-call. The minutes of previous meeting read, and, after the omission of Dr. Lintz's citing a case had been rectified, were approved. The essayists of the evening not being present, Dr. Hoskins addressed the members on meat and milk inspection, saying that the present law is so defective that it is almost an impossibility to get a conviction, if ever so guilty, consequently the Board of Health of this city propose to have amendments to strengthen the law and make it effective.

An Act to amend Section 1 of an Act entitled "An Act to Prevent the Adulteration of and Traffic in Impure and Unwholesome Milk in Cities of the second and third Classes," approved the 7th day of July, A.D. one thousand eight hundred and eighty-five, so as to make the said Act a general Act. It was moved and seconded that we indorse the said amendment. Passed.

An Act to amend Section 3 of an Act entitled "An Act to Prevent the Adulteration of and Traffic in Impure and Unwholesome Milk in Cities of the second and third Classes," approved the 7th day of July, A.D. one thousand eight hundred and eighty-five. This amendment to cover the whole State. Indorsed.

An Act to provide for licensing slaughter-houses in the several cities and boroughs of this commonwealth :

Section 1. Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania, in General Assembly met, and it is hereby enacted by authority of the same, that from and after the first day of June next no slaughter-house shall be maintained in any city or borough of this commonwealth without a license therefor having been first obtained from the Board of Health of such city or borough, or, where no such board exists, from such other officers as the councils of such city or borough shall designate as the party to issue such license.

Section 2. The councils of the several cities and boroughs of this commonwealth shall provide, by ordinance, for the issuing of such license, and fix the fees therefor, which shall not, however, exceed ten dollars (\$10) per annum.

Section 3. No person shall carry on any slaughter-house, in any city or borough, after such license-fee shall be fixed by ordinance, without first obtaining such license. Any person carrying on any slaughter-house without such license shall be guilty of a misdemeanor, and, upon conviction, shall be sentenced to pay a fine not exceeding one hundred dollars (\$100), or undergo imprisonment not exceeding three months, or both, at the discretion of the Court.

Section 4. Any person carrying on a licensed slaughter-house shall, at all times, give free access to any inspector appointed by authority of law, either by the Agricultural Department of the United States Government, or by the State of Penn-

sylvania, or by the State Board of Health, or by the local Board of Health, or by the city or borough in which such slaughter-house is located.

Section 5. In any city or borough in which a license shall be provided for by ordinance, the Board of Health shall have authority to make rules and regulations governing such slaughter-houses; a violation of such rules and regulations to be punished by a revocation of the license, and by the imposition of such penalties as the said Board may deem proper, which penalties shall be pecuniary, and may be collected by suit, wherein the city or borough shall be plaintiff. Indorsed.

To amend an Act entitled "An Act to Prohibit the Sale of Unwholesome Meats," approved 7th day of May, 1855. The clause in the Act making it unlawful to kill and expose for sale veal less than three weeks old, is amended to read not less than five weeks old when killed, and weighing less than sixty pounds, dressed weight. Approved. •

An Act to amend section 69 of an Act entitled "An Act to Consolidate, Revise and Amend the Penal Laws of this Commonwealth," approved the 31st day of March, 1860 :

Section 1. Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania, in General Assembly met, and it is hereby enacted by the authority of the same, that Section 69 of an Act entitled "An Act to Consolidate, Revise and Amend the Penal Laws of this Commonwealth," approved the 31st of March, 1860, which reads: "If any person shall sell or expose for sale the flesh of any diseased animal, or any other unwholesome flesh, knowing the same to be diseased or unwholesome, or sell or expose for sale unwholesome bread, drink or liquor, knowing the same to be unwholesome, or shall adulterate for the purpose of sale, or sell, any flour, meat or other article of food, any wine, beer, spirits of any kind, or other liquor intended for drinking, knowing the same to be adulterated, or shall adulterate for sale, or shall sell, knowing them to be so adulterated, any drugs or medicines, such person so offending shall be guilty of a misdemeanor, and, upon conviction," etc. Indorsed.

Dr. Hoskins next read the Act for the licensing of milk dealers and the inspection of dairies, etc. Approved.

W. S. KOOKER, *Secretary.*

Indiana Association of Veterinary Graduates.—The annual meeting of the Indiana Veterinary Association was held at the New Clinton House, Kokomo, Ind. January 10th and 11th, 1893.

The meeting was convened at 1.30 P.M., the 10th, the president W. L. Williams in the chair. There were present, Drs. F. A. Balser, C. N. Bell, L. N. Roberts, M. J. Schaeffer, W. L. Williams, J. N. Honan, J. C. Rodger, A. J. Thompson, T. B. Pote, A. B. Carter, O. L. Boor, P. Justice, J. W. Watson, and C. M. Stull.

The minutes of the previous meeting were read and approved.

The Treasurer, Dr. Galbraith, being absent on account of sickness, presented his report through the Secretary, showing the association to be in improved financial condition.

The following named veterinarians were proposed for membership: J. W. Reed, R. L. Chamberlain Fred. Braggington, E. T. L. York, J. D. Sturn, T. B. Pote,

A. B. Carter, O. L. Boor, P. Justice, J. W. Watson, C. M. Stull, S. Fitch and O. G. Whitestone. On motion of Dr. Roberts, the Secretary was instructed to cast the ballot of the association in favor of all the applicants and they were announced duly elected.

A communication was presented from Dr. E. F. Diggs, tendering his resignation as a member on account of engaging in the manufacture and sale of secret "specific" medicines, which upon motion of Dr. Roberts, was accepted and the Secretary instructed to notify Dr. Diggs accordingly.

On motion of Drs. Bell and Roberts, a committee of three, consisting of the President, Vice-President and Secretary, was created to revise the constitution and by-laws, with power to print the same at the expense of the association and have it ready for presentation to the association at its next meeting.

Dr. Bell then presented his paper on "Amputation of the Penis," in which he detailed several cases of more than ordinary interest, occurring in his own practice. The paper was followed by an interesting discussion participated in by almost all members present, during the course of which many instructive cases of this operation were related and numerous useful suggestions brought out, chief of which were that direct amputation through urethra and corpus cavernosum was likely to be followed by urethral stricture, and that this was preventable by dissecting out the urethra, and allowing it to project beyond the corpus cavernosum, etc.

The association then adjourned to meet at the Elks Hall to which session the general public had been invited to be present, but owing to very inclement weather the audience proved small though appreciative. The Vice-President, Dr. Bell presided, and the President delivered his annual address entitled "The Relation of the Veterinarian to the Public," in which the speaker showed that these relations had become so important that the veterinarian constituted an essential factor in the progress prosperity and health of the people. This was followed by a well prepared paper by Dr. A. G. Thompson entitled, "Homeopathy in Relation to Veterinary Science," after which the meeting adjourned to the Clinton House and fully discussed it.

The president then called the attention of the association to the approaching International Veterinary Congress to be held at Chicago, September, 1893, and urged that the veterinarians of Indiana should fully awaken to their opportunities and responsibilities in this which will doubtless prove the most important veterinary meeting so far held in America.

We detailed the many courtesies extended to visiting veterinarians at Boston, last September and suggested that equally good entertainment should be provided at Chicago, for all attending veterinarians.

On motion of Dr. Thompson, the president appointed Drs. Boor, Stull and Balser a committee to confer, and act with like committees already appointed by the state associations of Illinois and Iowa for making arrangements and providing entertainment for the international meeting. The association then proceeded with the election of officers for the ensuing year with the following results: President, W. L. Williams, Lafayette; 1st, 2nd, and 3rd Vice-Presidents, Drs. C. F. Bell, C. M. Stull, and G. W. Roberts, respectively; Secretary, J. E. Cloud, Richmond; Treasurer, F. A. Balser, Newcastle; Trustees, A. J. Thompson, T. B. Pote, O. L. Boor, M. J. Schaffer and J. W. Watson.

On motion of Dr. Bell it was decided to hold the next meeting of the association at Newcastle, in July.

The association then adjourned to meet at 8 A. M., the 11th, when through the

courtesy of Dr. Bell the members visited the Kokomo Plate Glass Works. one of the largest concerns of the kind extant, where the members were shown hurriedly the various departments in active operation.

The members then proceeded to Dr. Bell's infirmary, where Dr. Balser demonstrated in a neat manner the method of castrating cryptorchid horses, after which the meeting was called to order at the New Clinton House and an interesting paper presented by Dr. Honan, on "Inversion of the Uterus," which was followed by a spirited discussion engaged in generally by members present, the discussion turning largely upon the question of the necessity for retaining sutures truss or pessary after replacement, the general opinion seeming to be that they were at least useless in most cases especially if care be taken to straighten out the invaginations of corona and properly replace them and then withdraw the arm slowly and cautiously after the lapse of several minutes after replacement.

A paper by Dr. W. B. Wallace was then presented by Dr. Bell, entitled "Fracture of the Os Pedis," in which a rather remarkable ease was reported which according to the views of most members present was due to osted porosis.

On motion of Dr. Stull it was determined to secure necessary funds for assisting in entertainment of international veterinary congress by subscription.

Hearty good will prevailed throughout the meeting, the papers submitted were very good, the discussions were unusually spirited and instructive, the attendance larger than at any previous meeting and the accessions to membership also exceeded in number and value those of any prior meeting, so that on the whole those present felt greatly encouraged and considered this the best meeting in the history of the Indiana Veterinary Association. The meeting was then adjourned to convene in New Castle, early in July.

W. L. WILLIAMS, *President.*

J. E. CLOUD, *Secretary.*

MONTREAL, CANADA, JAN. 12, 1893.

The Montreal Veterinary Medical Association.—The Montreal Veterinary Medical Association met in the college lecture room this evening with the President, Dr. Mills in the chair; Vice-President, Dr. Baker, was also present.

Mr. Cleaves reported a case of "Nervous Prostration in the Dog," a Cocker spaniel bitch, which had come under his care. The most prominent symptoms were: animal lying on its side, unable to rise, muscles twitching, which was the first symptom noticed. Eyes clear, pulse too rapid to be counted, temperature 103 degrees, respirations hurried.

She had had puppies seven in number, three weeks previous, three of which had been disposed of; she seemed excited about the puppies. Treatment: Was removed from sight of puppies, and made comfortable. Pot. Bromide gr. x, was given every two hours, and when any pain was present Tr. Opium m x.

After the animal began to improve, at the end of eight hours, two doses of the following were given with an hour's interval:

R. Pot. Bromide gr. v.
Tr. Bellad. m viii.
Tr. Aconite m v.
Chloral Hydrate gr. v
Aquae q. s.

At the end of ten hours she appeared normal, except for weakness.

Dr. Baker stated that he frequently met an affection in bitches, similiar to this, after whelping. They rarely died.

Mr. Orr took for his subject Laminitis, Peditis or founder, a term supposed to be given, because the animal resembles a ship foundered at sea, being perfectly helpless.

In this paper the causes, symptoms, pathology and treatment were most thoroughly dealt with. [See page 3.]

As this is a very common disease as seen in practice, and as all the readers are more or less acquainted with nature, causes, symptoms, pathology and treatment, will pass on to the discussion which is brought out. The manner in which the writer defended his paper is worthy of comment, and showed that he understood the disease, both theoretically and practically.

The following are some of the points dwelt on in the discussion :

Ques. Does animal stand when all four feet are affected? *Ans.* May stand all the time or may be intermittent with lying. When he stands, the front feet are extended and hind feet advanced more under belly.

Ques. What is the action in blood letting? *Ans.* To lower blood pressure and relieve arterial tension.

Ques. Does lowering blood pressure act locally or generally? *Ans.* Affects the whole body.

Ques. Would you use Amile Nitrite or Nitro-glycerine to relieve Art. tension? *Ans.* Never saw it tried, or read anything concerning it in this disease.

Ques. Why are feet affected from overfeeding? *Ans.* The whole system is affected.

Ques. Can cold water produce laminitis when animal is warm?

This brought out a discussion. Dr. Gadsden, of Philadelphia, says it can not, and has experimented in this line with horses of St. R. R. of that city with negative results, also with his own horses.

Ques. How does Super-purgation set up laminitis? *Ans.* Through the nervous system as an irritation.

Ques. Is there anything contrary to local blood letting? *Ans.* It is the course to be adopted.

Ques. Can Metastasis be explained through a reflex? *Ans.* I believe it is not the explanation.

Ques. How much blood should be drawn? *Ans.* Enough to make an impression on the pulse.

Dr. Baker was called upon to say a few words. He thought it well to keep our Physiology with us in our treatment of disease.

“Metastasis” is generally a mistake in diagnosis.

May have laminitis, associated with other diseases.

Blood letting goes in waves. Have had as good results without blood letting. Generally good to bleed if animal is in first stage.

Local blood letting may prevent sloughing of the sole.

Dr. Mills thought there was a great deal in “laminitis” that suggests “gout.” The structure of the horse’s foot should be kept clearly in mind. Metastasis begins in the endoderm. Metastasis is to be explained through the nervous system largely, but the term is greatly abused. Life itself is a kind of reflex.

Montreal Veterinary Medical Association.—The regular meeting of the Montreal Veterinary Medical Association was held in the lecture theatre of the faculty building, 6 and 8 Union Avenue, December 21st, 1892, the Vice-President, Dr. C. McEachran, in the chair.

The business of the evening finished, Mr. Brainard was called upon to report a case of "artificial impregnation in a mare."

The mare was a black roadster, fifteen hands high and eighteen years old, and was what is commonly known as a "constant horser." Her owner had failed to ever get her in foal, she having been served more than fifty times within the last five years.

On examination, the os was found to be hard and contracted, but managed to dilate sufficiently to allow the little finger to be inserted.

Another mare was served, and a small, wide-mouthed bottle, containing water at about blood heat, was inserted into her vagina, and a small quantity of semen collected. This bottle and its contents was passed into the vagina of the subject, and inverted over the mouth of the uterus. The mare was then taken home, became quiet, laid on flesh, and at the end of the usual term gave birth to a healthy, active foal.

After some discussion on this interesting case, Mr. Campbell, the essayist of the evening, was called upon for his paper on "Diet for the Dog." This essay was carefully prepared, and gave rise to much discussion. He commenced by giving the definition of the word "diet." It was derived from the Greek word *διαίτα*, meaning a system or mode of living.

The body is composed essentially of a semi-fluid substance called protoplasm, whose chemical constituents were C. H. O. N. P. K. Na. Mg. Cl., etc., combined in a very complex molecule, containing water. This protoplasm is the basis of life, and is constantly wasting away by a process of oxidation, and is being as constantly built up by a fluid in the blood which was in turn prepared especially for this complex substance.

As the name of the essay implies, the materials from which protoplasm is built up will be more particularly dealt with, *i. e.*, the food stuffs.

These substances are divided into :

- I. Organic, of which we have two subdivisions.
 1. Nitrogenous bodies.
Albumens and albumenoids.
 2. Non-nitrogenous bodies.
Carbohydrates and fats.
- II. Inorganic, two subdivisions.
 1. Water.
 2. Salts.

Our domestic carnivora obtain their nourishment from both animal and vegetable matter.

To obtain the best possible results in dog-breeding, it is necessary that their food contain all of these classes of foods; if deprived of any one of these, the animal will die sooner or later.

As the conditions which cause quickening or slowing of the metabolism are brought into play, so is the quantity of food required increased or diminished.

Diet for Pregnant Bitches—Is of that class best suited for the wants of both mother and young; should be pure, fresh and highly nutritious, and not of a kind

to induce plethora or the laying on of flesh, together with a good supply of pure water and good hygienic surroundings. After parturition, a diet abundant in nutritive properties, as eggs, milk, bread and milk, broths and gruel. Fatty foods slow metabolism, while nitrogenous foods quicken it. A diet rich in carbohydrates will give rise to a condition of fat formation.

For the Young.—The proper diet for the young is its mother's milk. This is the food designed by nature for the young, and cannot be improved upon. Sometime, however, the mother may not have sufficient milk to supply her large litter; here the use of an artificial food becomes necessary. Parvin says "a mixed nursing is better than a whole diet of artificial food;" which means, allow the puppy to get a reasonable amount from the mother, and make up the deficiency with artificial food.

(Mr. Campbell here discussed to some length the diseases of the bitch, and the manner in which these diseases, together with the medicines used to produce their relief, affected the supply and quality of her milk.)

Artificial Foods.—The artificial food par excellence for old and young is milk. It contains proteids, fats, carbohydrates and water, and in such a condition that the most sensitive digestive tract can assimilate it. After puppies are weaned, cow's milk can be substituted for the mother's, and to this we add porridge, bread, etc., as he gets older. When powers of digestion increase, the milk can be substituted by broth, soups, etc., to a certain extent; also an occasional bone to pick will be a source of amusement, as well as help him cut his teeth and strengthen his jaws. A course of milk diet long continued will favor the growth and development of entozoa. This should receive careful attention.

For the Adult.—Spratt's biscuits are an excellent preparation, combining nearly all the properties of a perfect food, but they become rather expensive to an individual who keeps a large kennel. Where meat is fed, it should always be cooked, and thus destroy all the germs and parasites it may contain. In vigorous animals a little raw meat once in a while will do no harm, provided that the dog has plenty of exercise. Man's interference by artificial selection and domestication have wrought many changes in the dog. Every generation has placed him further and further from his natural condition, and no organ shows the effects of these changes more than the alimentary tract; very little upsets its workings. A good diet is boiled horseflesh, finely divided and mixed with equal parts of some starchy elements, such as bread, biscuit, etc., the whole made into a porridge with the liquor from the pot in which the horseflesh has been boiled. This diet is cheap and palatable, and could be fed advantageously to a large kennel.

Diet in Disease.—Here we have a departure from the normal condition. A diet which will produce the greatest possible good with the least possible harm to the system is indicated. We must, however, take the following precautions:

1. The food must not be contaminated by the presence of any germ.
2. We must not give a stimulating diet where the system is not strong enough to bear it.
3. When we have great depression, we must not overload the stomach with worthless substances, which in health are useless and doubly so in disease.

Derangements of the digestive tract may be brought about by either overfeeding or not giving the dog enough of good nutritious diet. The effect of this is often shown in the skin. We are told "as the tongue to man so is the skin to the dog in indicating the condition of the alimentary tract." This is essentially true, for by a system of overfeeding, the skin will become eczematous in character, and a

large variety of serious complications result. Distention of the stomach by gas may cause irregular breathing and heart action, and if the distention be due to gas, it may proceed until rupture of the organ takes place. Emphysema of the lungs is probably due to this distention.

Vomiting—Diarrhoea and constipation may all be referable to the quality and quantity of food, etc. In a very excellent paper by Pasteur, it was remarked that biliary calculi were due in a great measure to excess of food and lack of exercise. Mr. Campbell concluded after pointing out minutely the value of the proper use of diet in various febrile conditions of the system, and also of the abuse that this valuable therapeutic agent was subjected to. Both Mr. Brainard's report and Mr. Campbell's essay were favorably commented upon by the President, and after each had been well discussed the meeting adjourned.

Montreal Veterinary Medical Association.—The regular fortnightly meeting of Montreal Vet. Med. Association was held at the usual time and place (8 p. m., 6 and 8 Union Avenue, Feb. 10th, 1893. Dr. D. McEachran in the chair. There were also present: Drs. Mills, Morrow and Baker, and a large attendance of the members.

The usual routine of business having been disposed of, the Chairman called on Dr. Mills for a paper on the "Care and Breeding of Pigeons and Poultry and their Treatment in Disease."

This discourse was very instructive, and included much of the experience of the essayist as a breeder-exhibitor.

Considerable discussion resulted and the members, availing themselves of the rare privilege of discussing this subject, obtained much valuable information with regard to the various and almost unknown ailments of poultry and feathered pets.

Chicken cholera, gapes, roupe, etc., were pretty fully dealt with, while many of the minor ailments, such as impaction, tumors, etc., received due consideration.

Mr. Wilfred Plaskett reported a case of tetanus which he had treated successfully during the holidays.

The animal in question was a light bay mare, which had picked up a nail on the street about the 20th of July and became extremely lame. She was taken to a farrier and the nail was found to have penetrated the aufero-posterior part of the frog, and was removed and the lameness ceased. The nail, however, had penetrated the sensitive frog, and at the end of two weeks the animal refused food and showed a disinclination to move.

On further examination of the frog it was found that the whole of the horny frog had separated from the sensitive and had to be removed. The wound was dressed with medicated tar and opium, the animal placed in slings and box darkened so that she would be disturbed as little as possible.

Symptoms were marked.—Nose protruding, nostrils dilated, corners of mouth retracted, eyes sunken, membrana metotans reflected, profuse ensalivation, general muscular system in a state of tonicity, shown by method of standing; on manipulation, muscles were found to be inordinately hard, acceleration of breathing and other diagnostic features so well known and invariably constant in this condition. Tem-

perature never showed a higher reading than 101 degrees, Fah., which was present on Aug. 4th. Pulse was not much altered, in fact symptoms pointed to a mild nature of the disease, there being an absence of hyperæsthesia, which marks the worse forms of tetanus.

Treatment.—Diet nutritious and in a fluid condition, so as to permit patient to suck up and swallow without attempting to masticate; oatmeal gruel and sloppy brans were constantly before her, in which there were placed her medicines, consisting of pot. brom., chloral hydrate and magnesium sulph. The two former were used for their motor depressant action; the latter to keep the bowels open. For the first ten days, after being placed in slings, she appeared very little different, except the excitement of being in slings caused a rise in temperature and pulse; of little consequence, however. After ten days a decided improvement was observed. Jaws could be moved pretty freely.

At the end of three weeks process of mastication was pretty good, as the food no longer accumulated between the molars. She was taken out of the slings and groomed and any spots chafed were dressed. At the end of another week she was taken out, exercised, and, as she showed no signs of muscular rigidity, was pronounced cured.

The President asked Mr. Plaskett “on what physiological basis he prescribed such treatment.”

Ans. The disease is of such a nature that it cannot be aborted, hence darkness, quietness, etc., all required to bring about a good result.

Ques. Explain quieting treatment.

Ans. The system when in this condition is more susceptible to stimuli than usual, consequently necessary to bring patient into an isolation from any noises, etc., and to overcome this hyperæsthesia to a certain extent with motor depressants.

Ques. What is tetanus due to?

Ans. A microbe which gets into a wound and whose toxins produce the tetanic spasms of the muscles. The microbe is supposed to remain at the wound and when the toxins attain a certain degree of virulence that the microbe is in turn killed.

The essayist of the evening, Mr. Stirrock, was then called upon by the chairman for his paper on navicular disease.

He commenced by stating that there was much conflicting opinion with regard to the different causes of this disease and the part of the navicular apparatus where these changes first began.

A short history of the disease was then given and the symptoms, progress and treatment of the disease fully dealt with it. As to the symptoms, they were very characteristic, and the pointing of the diseased limb one of the surest indications.

The predisposing causes were principally congenital, and the necessity of careful selection of animals in which there was an absolute freedom from any lack in conformation of the navicular apparatus, for breeding purposes, was demonstrated. Exciting causes were chiefly traumatic ones. Bad shoeing being one of the most futile, exciting causes was proven by many of the cases which had come under the essayist's notice.

As to the treatment the essayist ventured to say that shoeing was the most radical and safe method in the early stages.

At the conclusion the President complimented the essayist on the style and

thoroughness with which he had dealt with his subject. Considerable discussion ensued among the members with regard to the advisability of performing neurotomy in all cases.

Several questions were asked the essayist on the subject of shoeing in navicular disease.

Ques. How should a shoe be made to relieve chronic lameness from navicular disease?

Ans. By modelling the new shoes after the old ones.

Ques. In acute cases is it a good idea to shoe with high heels?

Ans. Perfectly level shoes the best.

Ques. Is it safe to perform neurotomy in case of animal having a corn?

Ans. No; as reparative processes would cease, and that is what is required in case of a corn.

Ques. Which would be most advisable in early stages frog seton or neurotomy?

Ans. Frog seton in early stages and neurotomy in later stages.

New Jersey State Veterinary Society.—The New Jersey State Veterinary Society held its semi-annual convention at Saenger Hall, in the city of Newark, N. J., on Thursday, February 2d, with the President, Dr. J. D. Hopkins, in the chair. There was a good attendance of members from various parts of the State.

The minutes of the previous meeting were read and approved.

The President gave an instructive address on the duties of veterinarians and his usefulness as a sanitarian; also words of good cheer as to the future of the profession, claiming that in the near future our services will be more fully appreciated than at present. Regretting very much that there seemed to be a lack of brotherly feeling among veterinarians, he hoped soon to see us working as one person, and striving for the elevation of our profession.

After hearing the reports of the Secretary, Treasurer and Board of Censors, the election of new members, the application for membership, the Society passed to the reading and discussion of papers. Dr. R. L. Tucker, of Plainfield, read a paper on "Bronchitis in the Dog." Dr. J. D. Hopkins one on "Differential Diagnosis between Osteo Porosis and Rheumatism." Both papers were freely discussed; quite a difference of opinion was manifested, especially as to Dr. Hopkins' statement that rheumatism did not exist in the adult horse. After parting with the discussion of the papers, the subject of "Foot Wounds" was taken up, and the discussion was only at its beginning when, owing to the lateness of the hour, the Society was compelled to adjourn.

A hearty vote of thanks was tendered to the essayists.

Adjourned to meet in annual session in the city of Newark.

T. SELLERS, D.V.S., *Secretary.*



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SESSION 1892-93.

The Third Session of the Faculty (being the twenty-sixth of the Montreal Veterinary College) will be opened on Tuesday, the 4th of October, 1892, by an introductory lecture, at 8 P. M., in the lecture room of the Faculty, No. 6 Union Avenue. The regular course of lectures will begin on Wednesday, 5th of October, at the hours named in the time-table, and will continue till the end of March.

For Annual Calendar and full information, apply to

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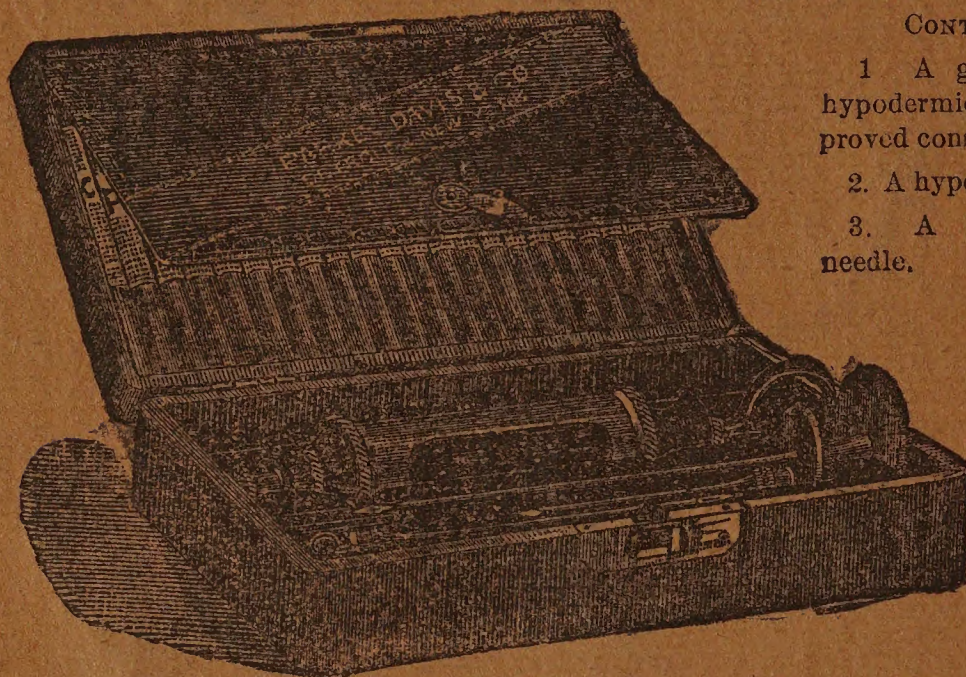
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